

2010 Update: Mobility Assessment and Bottleneck Changes

Traffic Quality on the Metro-Atlanta State Highway System



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Mobility Assessment and Bottleneck Changes, 2010 Update

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**Prepared for the
Georgia Department of Transportation
by Skycomp, Inc, Columbia, Maryland**



Abstract: This publication summarizes the location and extent of daily recurring congestion on the state highway system in the 22-county metro-Atlanta planning region, as measured during morning and evening aerial photo-surveys conducted in the spring and fall of 2010. It also presents the locations where the most significant changes were recorded on the system between that period and 2008/2007.

Disclaimer: The contents of this publication reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Georgia Department of Transportation or the Federal Highway Administration. This publication does not constitute a standard, specification or regulation.



CONTENTS

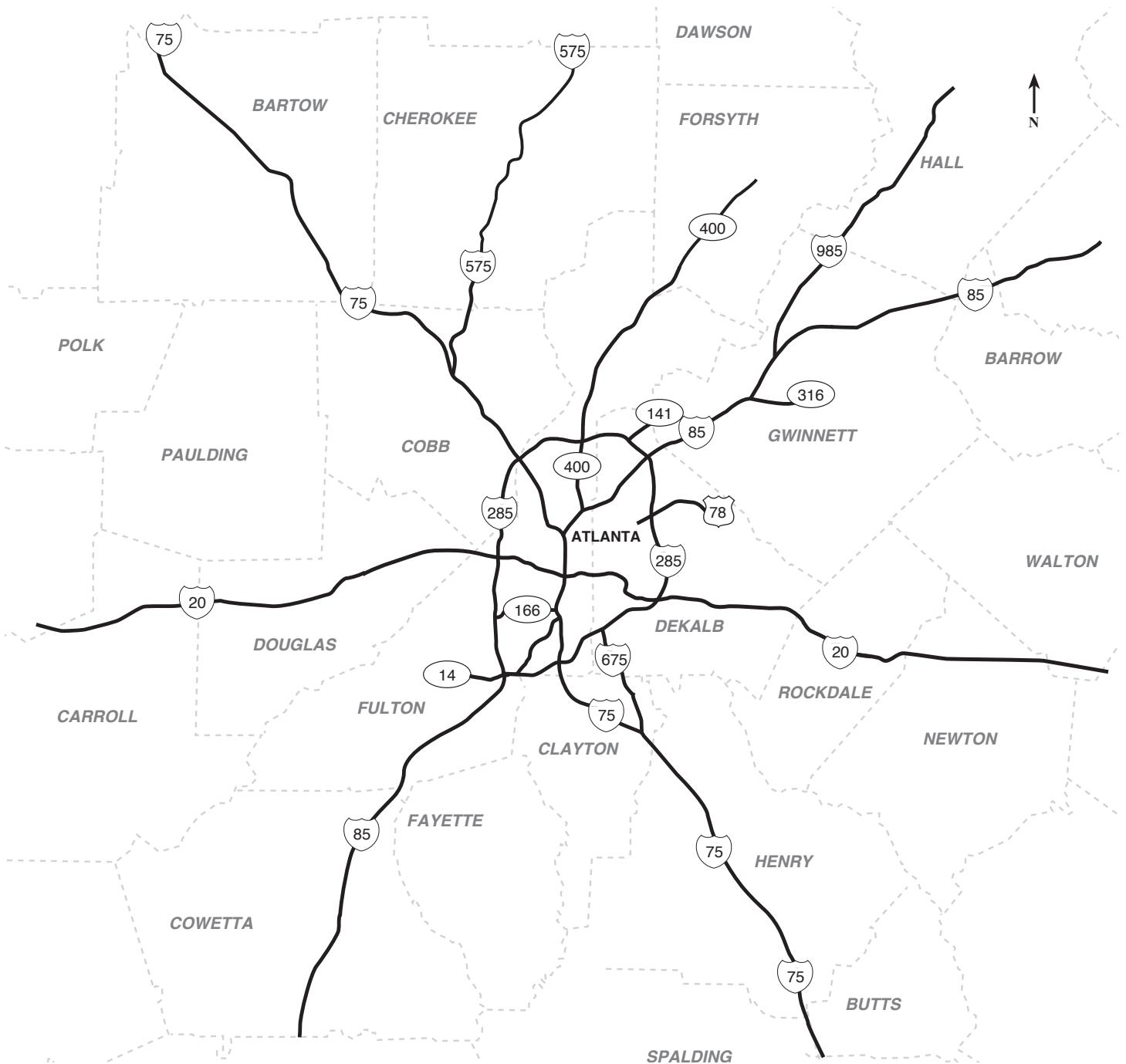
<i>Introduction</i>	1
 <i>Part One: Current</i>	
<i>Region-wide Mobility Assessment & Bottleneck Inventory, 2010</i>	5
<i>Section 1.1: Performance rating overview and freeway congestion rankings</i>	6
<i>Section 1.2: Morning bottleneck inventory maps</i>	11
<i>Section 1.3: Evening bottleneck inventory maps</i>	26
 <i>Part Two: Comparison</i>	
<i>Bottleneck Changes, 2010 Update</i>	40
<i>Section 2.1: Sites with improved mobility</i>	43
<i>Section 2.2: Sites with degraded mobility</i>	83
<i>Section 2.3: Comparative arrowhead maps, morning</i>	96
<i>Section 2.4: Comparative arrowhead maps, evening</i>	100

Photos

*(Opposite) Morning traffic flow toward downtown Atlanta,
along the recently-revamped I-75 / I-85 corridor.*

*(Front cover) Early-morning southbound congestion on I-75
in Marietta. Vehicles waiting to merge on the Canton Road
Connector are evident near the center of the photo.*

2010 SURVEY AREA: REGIONAL FREEWAY NETWORK





Introduction

This publication summarizes the state of mobility and congestion on 2,700 miles of freeways and state highways serving the Atlanta urbanized planning region, based on surveys conducted during 2010 peak commute periods. This report also compares those findings to 2007 / 2008 survey findings, acquired of the same highways using the same methodologies. These pages will show that congestion throughout the system for the most part measured at levels close to those previously measured; however, improved mobility ratings were recorded for a number of highway segments directly resulting from capacity- and efficiency-enhancement projects completed since 2007. For other highway segments where improved mobility was documented, lower volumes as a result of the recession may have contributed to improved flow. As expected, some highway segments were also identified with higher levels-of-service, the cause of which could not be determined.

Background

In 1998 the Georgia Department of Transportation (GDOT) initiated a program to monitor the quality of highway traffic flow across the 22-county Atlanta urbanized state highway network, through the use of time-lapse photography acquired from fast-moving aircraft. Aerial photography is well suited for this purpose because it permits the comparison of mobility and congestion levels across a large highway network using one uniform set of analytical procedures. The photography also reveals insights about the underlying causes of congested bottlenecks, useful for analysis or to help decision-makers better understand technical recommendations. Information is produced through this program to support the long-range planning process, by providing a clear understanding of current conditions and trends from which realistic projections can be made. This program also provides a means to evaluate the effectiveness of specific completed projects, where those investments were intended to maintain or restore highway mobility.

Aerial survey operations have been repeated every 2-4 years since 1998, with new highway sets added for coverage in 2002, 2004 and 2010. Survey iterations have been conducted during both the spring and fall with as many as 20 aircraft working at a time. Flights have been conducted during peak morning and evening commute periods (6:30 to 9:30 a.m. and 4:00 to 7:00 p.m.), and repeated until 24 samples of each covered highway have been acquired. After the effects of confirmed or suspected incidents have been excluded, traffic flow has been rated from the photography by hour, segment and direction. Performance rating database tables were then assembled; these tables indicate where highway usage was light, moderate, or heavy, and identify the location, extent, severity, and duration of congestion.

The database now contains mobility performance ratings in the Atlanta urbanized region across a 13-year period. Methods have been developed to store survey data and images to facilitate fast and easy retrieval. Through the GDOT website (<http://www.dot.state.ga.us>), users can download the entire series of reports, extract performance rating tables from the underlying database, generate customized comparison graphics, and view interactive maps that are annotated with red or orange bottleneck arrows. These arrows depict every bottleneck found on the highway network, and are hyper-linked to underlying highlight aerial photographs that open in separate windows. This collection of materials is suitable for the full range of mobility-related planning activities, from acquiring an executive-level understanding of the nature of congestion throughout the region, to providing data for specific long-range planning studies, to simply supplying an archive of photographs, graphics and rating tables for reports & slide shows about specific highway corridors.

Mobility Assessment and Bottleneck Changes, 2010 vs. 2007/2008

This publication will provide answers to the following questions:

1. Where were the major recurring bottlenecks found on the surveyed state network during the 2010 survey period? Which were most severe?
2. Where and to what degree has congestion been spreading on the state network since the '07/08 survey period?
3. Where has mobility improved on the surveyed network since the '07/08 survey period, and to what degree is it possible to associate those improvements with completed projects?

Accordingly, **Part One: Current** provides a map-based inventory of system-wide bottlenecks, as documented during the 2010 survey flights. It also includes model-based rankings of all significant freeway bottlenecks, including separate 1-hour, 2-hour and 3-hour groupings. **Part Two: Comparison** discusses macro-level measures indicating that, across the system as a whole, congestion levels found in 2010 were similar to those found in '07/08. This part also reports that many segments with improved mobility resulted directly from bottleneck elimination projects. Accordingly, such segments are presented with descriptions of what work was done, augmented with before-and-after aerial photographs that show the impact on traffic flow. Similarly, because improved mobility was partly offset by measurements of degraded flow, another section follows that identifies specific segments where congestion had spread (also augmented with before-and-after photography). Part Two concludes with a set of comparative maps, which are modified versions of the bottleneck maps referred to in Part One above; these maps introduce the use of green arrows to show where mobility had improved or cleared entirely, and the use of black and gray arrows to depict where congestion did not appreciably change.

Interactive Web-based Resource

As noted above, this report is augmented with a web-based slide show that has been integrated into the official GDOT website. The maps shown in this report are also found on that website, and are linked to several thousand highlight aerial photographs that illustrate typical traffic conditions at each bottleneck. That website also contains links to the underlying traffic quality database, where users can generate reports that show how traffic performance ratings have changed since 1998. The link can be found at www.dot.ga.gov/statistics/trafficsurvey/.

Underlying Documentation and Methodologies

Underlying technical reports that contain system-wide performance rating maps and tables, as well as descriptions of the specific methodologies used to generate them, are provided under separate cover and are available for download through the GDOT website. For 2010, the survey reports are entitled:

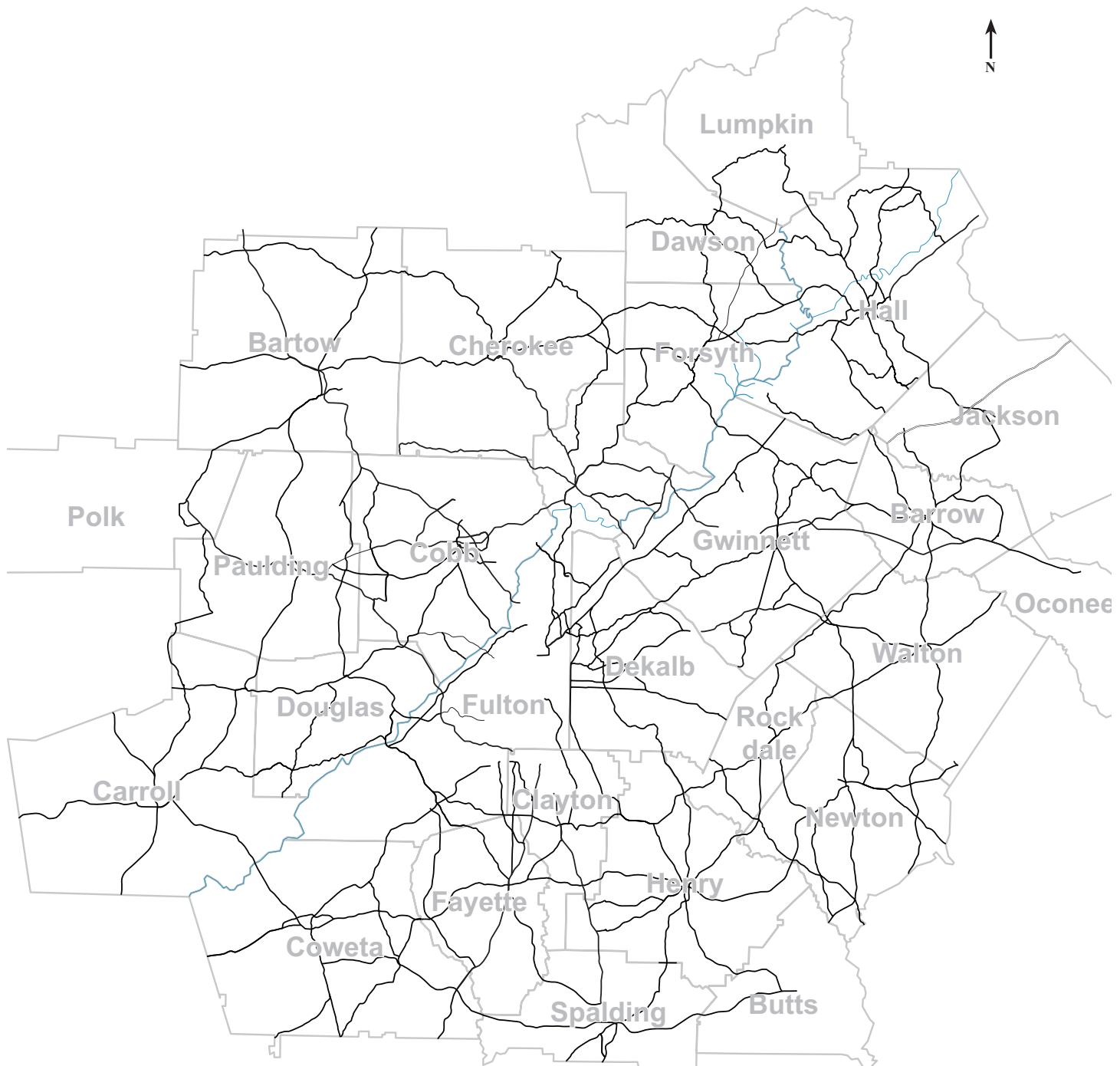
1. Traffic Quality on the Atlanta Regional Highway Network: VOLUME ONE: FREEWAYS (2010);
2. Traffic Quality on the Atlanta Regional Highway Network: VOLUME TWO: ARTERIALS (2010).

Survey reports have also been produced for the earlier iterations of this program, and are available for download at the website as described above. They also can be acquired by contacting Skycomp directly (see below).

Questions

This program is directed and managed by the GDOT Office of Planning, and is executed by Skycomp, Inc. Questions about the program should be directed to Reuben Woods at rwoods@dot.ga.gov, or 404-631-1806.

2010 SURVEY AREA: REGIONAL ARTERIAL NETWORK





PART ONE / CURRENT:

Regionwide Mobility Assessment and Bottleneck Inventory, 2010

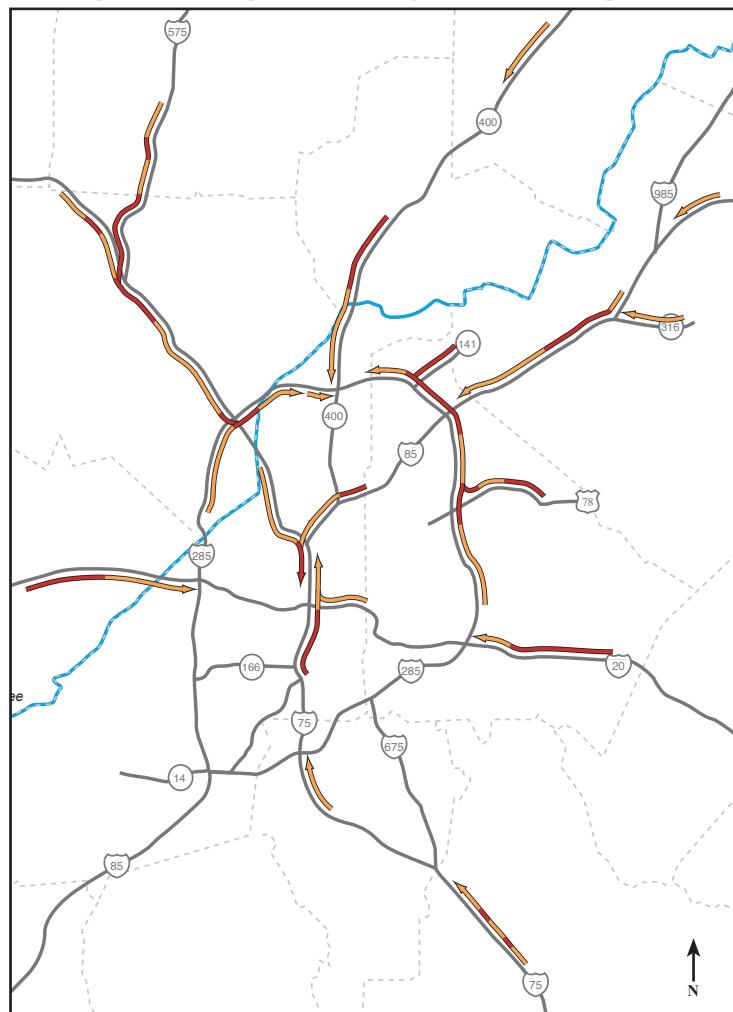
This section of the report discusses the general nature of congestion on the metropolitan-Atlanta area highway network. It also provides an inventory of the region's congested bottlenecks, both freeways and signalized arterials, as derived from 2010 survey data. Average delays through the congested freeway zones have been estimated using a density-based speed model; each bottleneck has been ranked in severity based on this model. The most severely congested signalized arterial corridors are also identified.

Qualitative observations about regional Atlanta congestion

Significant highway traffic congestion in the 22-county Atlanta planning region usually follows the general flow of inbound traffic (toward Atlanta) during the morning commute period, and outbound flow during the evening period. The primary commute routes are the interstate highways and state arterials aligned with the radial movements: I-75 and I-575 to the northwest; SR 400, SR 316 and I-85 to the northeast; US 78 and I-20 to the east; I-75, US 19/41, SR 85 and I-85 to the south; and I-20 to the west. Not all congested corridors are radial in nature, however. There are major suburb-to-suburb movements in the region that generate congestion, following a circumferential rather than radial pattern. While much of this movement is centered on I-285, other major circumferential corridors include SR 92, SR 120 and SR 20 to the north; SR 20, SR 124 and SR 11 to the east; SR 138 and SR 920 to the south; and SR 6 and SR 92 to the west.

Many commuters to the north and west of the Chattahoochee River travel to and from work centers that are situated south and east of the river. The primary high-volume corridors toward and across the river – SR 400 from the north, I-75 from the northwest (also fed by I-575), I-20 from the west, and I-285 on the west and north sides – generate some of the greatest delays in the region. In fact, many of the circumferential movements in the western and northern areas – SR 120, SR 360 and Barrett Parkway in Cobb County, and SR 120 and SR 961 (Old Alabama Rd) in Fulton County – are severely congested leading to one of these corridors. One of the most severely congested arterial corridors is US 41 that closely parallels I-75 through Kennesaw and Marietta. Other key arterial routes across the river in Fulton County – SR 9, SR 140 and SR 141 – are also severely congested.

Figure 1.1 Congested Freeway Zones / Morning 2010



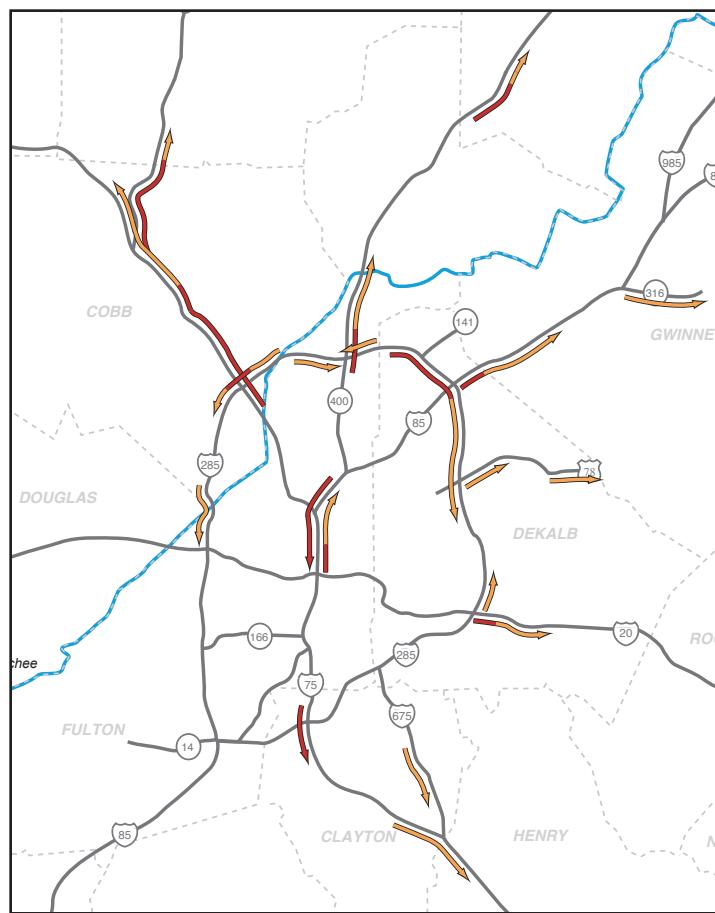
(Above) Typical morning congested zones on the freeway system are shown. Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent freeway congestion.

Another reality that influences the level of highway demand is the predominance of the region's work centers north of downtown Atlanta, with many job centers located near the northern interchanges of I-285 and I-85. Thus the greater traffic flows on I-285 converge to the north in the morning and diverge to the south in the evening; severe congestion on I-285 is found along those movements. South of Atlanta, I-75/I-85 carries demand not only toward downtown Atlanta in the morning, but also toward the northern employment centers, and thus is highly congested. During the evening peak period in the other direction, heavy southbound flow on I-75/I-85 toward downtown Atlanta competes with traffic merging from the downtown area; the result is greater southbound congestion toward the central business district than on the south side away from it.

Congestion is also found in the outlying counties that appear to be local in nature. Bottlenecks like this are found in Cumming / Silver City, Buford, Gainesville, Lawrenceville, Loganville, Winder / Russell, Covington, McDonough, Lovejoy, Fayetteville, Peachtree City, Newnan, Douglasville, Dallas / Hiram, and Cartersville. While many of these problems do not appear significant compared to the congestion on the high-volume corridors closer to Atlanta, in fact some long, single-file queues routinely recur on rural state routes where drivers do not have viable alternative routes; in some cases, such delays are substantial.

Lastly, it should be noted that in the Atlanta urbanized area, as in most large metropolitan areas, about 10-20 percent of highway lane-miles actually operate under congested conditions during peak demand periods (this figure varies depending on how 'congestion' is defined). Still, it is evident from the aerial photography that highway traffic moves with reasonable freedom on a large part of the system. Even when ordinary incidents occur that block traffic flow, rarely is the entire network in an area actually "grid locked". Thus, while this document is focused where mobility is inhibited, it should be recognized that, on a daily basis, many parts of the system carry peak- period traffic efficiently and at high travel speeds.

Figure 1.2 Congested Freeway Zones / Evening 2010



(Above) Typical evening congested zones on the freeway system are shown. Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent freeway congestion.



Section 1.1: Performance Rating Overview and Freeway Congestion Rankings

On freeway links, the average density of traffic flow is derived from overlapping time-lapse digital photographs taken at one-hour intervals over four different workdays. The morning survey periods are 6:30 to 9:30 a.m.; the evening periods are 4:00 to 7:00 p.m. Raw vehicle counts are first taken from the photography. Using these counts, traffic densities are calculated for all surveyed links (by flight, by direction and by time period). Then a screening is performed to identify and exclude atypical data – values either well above or below typical levels from all of the survey dates. The (typical) traffic density values that remain after this screening are averaged together by hour and by link, and then converted to level-of-service performance ratings "A" through "F", based on ranges defined in the 2010 Highway Capacity Manual (a widely-used planning guide produced by the Transportation Research Board of the National Academy of Sciences). The performance ratings database, therefore, contains six ratings for each highway segment, per direction: one for each of three morning hours, and one for each of three evening hours.

Because there is a mathematical correlation on freeways between vehicle densities and average travel speeds, it is possible to estimate average travel times for each link using a speed/density look-up table (this process is described in detail in Appendix B of the underlying technical report, Traffic Quality on the Atlanta Regional Highway Network: VOLUME ONE: FREEWAYS

(2010). Once this is done, link-by-link values are next aggregated into total travel time estimates through each congested zone, and then converted into corresponding average congested travel speeds. Last, the total minutes of delay are estimated through each congested zone, by subtracting the time it would have taken driving at a typical un-congested speed of 60 mph from the survey-generated travel time estimates. This is the basis for the ranking of freeway congested zones, as shown below in Figures 1.3 (morning) and 1.4 (evening).

The ranking tables in Figures 1.3 and 1.4, however, do not take into account duration of congestion. Therefore, a similar analysis was performed by screening the performance ratings database for zones that were severely congested (densities of 60 passenger cars per lane per mile or greater) for periods of either two or three hours. (These zones were typically sub-zones of the congested zones previously discussed.) Using the weighted average density value for each congested zone, separate rankings were made for two-hour congested zones and for three-hour zones. Those results are posted in Figure 1.5 (2-hour duration) and Figure 1.6 (3-hour duration).

Figure 1.3 Ranking of Congested Freeway Zones (one-hour duration) / Morning 2010

FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES											
COUNTY (vicinity)	PERIOD AM	ROUTE	Dir	CONGESTED ZONE (from) (to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	2010 RANK AM	2007 RANK AM	2005 RANK AM
Fulton	7:30 - 8:30	SR 400	SB	OLD MILTON PARKWAY - I-285	11.4	29	25.5	>10 min.	#1	#1*	#1*
Gwinnett	7:30 - 8:30	I-85	SB	SR 120 - PLEASANTDALE RD	10.3	21	22.6	>10	#2	top 10	top 5
Fulton	7:30 - 8:30	I-75/I-85	NB	SR 166 (LAKEWOOD FWY) - US 29 (NORTH AVE)	5.8	24	17.0	>10	top 5	top 10	top 10
Cobb	7:30 - 8:30	I-285	NB/EB	SR 280 (SOUTH COBB SR) - RIVERSIDE DR	8.7	31	19.4	>10	top 5	top 5	top 5
Dekalb	7:30 - 8:30	I-285	NB/WB	SR 260 (GLENWOOD RD) - ASHFORD-DUNWOODY RD	15.1	35	25.4	>10	top 5	#2	#2
Cobb	7:30 - 8:30	I-575	SB	SIXES RD - I-75	11.1	31	21.3	>10	top 10	top 5	top 5
Cobb	8:30 - 9:30	I-75	SB	WADE GREEN RD - WINDY HILL RD	12.9	38	21.0	>5	top 10	top 5	#2
Cobb	7:30 - 8:30	I-20	EB	SR 6 (THORNTON RD) - I-285	6.6	31	13.2	>5	top 10	top 10	top 10
Dekalb	7:30 - 8:30	I-20	WB	EVANS MILL RD - I-285	6.1	37	11.1	>5	top 10	top 10	top 10
Henry	7:30 - 8:30	I-75	NB	SR 20/SR 81 (HAMPTON RD) - I-675	9.3	39	14.3	>3	top 10	top 20*	top 20*
Dekalb	7:30 - 8:30	SR 141	SB	JONES MILL RD - I-285	2.8	25	6.9	>3	top 20	top 20	top 20
Dekalb	7:30 - 8:30	US 78	WB	STONE MOUNTAIN BYPASS - I-285	5.4	39	9.1	>3	top 20	top 10	top 20
Fulton	8:30 - 9:30	I-85	SB	N. DRUID HILLS RD - I-75	4.3	35	7.4	>3	top 20	top 20	top 20
Forsyth	7:30 - 8:30	SR 141	SB	SR 20 (BUFORD HWY) - MCFARLAND RD	6.9	41	10.0	>3	top 20	top 20	top 20
Fulton	7:30 - 8:30	I-20	WB	SR 421 (MORELAND AVE) - I-75/I-85	3.7	42	5.4	<3	top 20	top 20	top 20
Fulton	8:30 - 9:30	I-75/I-85	SB	I-75/I-85 MERGE - SR 10	2.3	35	4.0	<3	top 20	top 20	top 20
Fulton	7:30 - 8:30	I-285	EB	RIVERSIDE DR - SR 400	2.9	46	3.8	<1	top 20	NR	NR
Clayton	6:30 - 7:30	I-75	NB	SR 331 (FOREST PKWY) - I-285	0.8	29	1.7	<1	top 20	NR	top 20
Fulton	7:30 - 8:30	I-75	SB	PACES FERRY RD - I-85	4.5	51	5.2	<1	top 20	top 20	top 20
Gwinnett	7:30 - 8:30	I-85	SB	HAMILTON MILL RD - I-985	7.1	55	7.8	<1	top 20	NR	NR

* In 2005 and 2007, I-75 between SR 20 and I-675 was broken into two separate zones of congestion. In 2010, a mostly continuous zone of northbound congestion was found along this corridor.

Figure 1.4 Ranking of Congested Freeway Zones (one-hour duration) / Evening 2010

FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES											
COUNTY (vicinity)	PERIOD PM	ROUTE	Dir	CONGESTED ZONE (from) (to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	2010 RANK PM	2007 RANK PM	2005 RANK PM
Dekalb	5:00 - 6:00	I-285	EB/SB	CHAMBLEE-DUNWOODY RD - PONCE DE LEON AVE	10.3	29	23.2	>10 min.	#1	#1	#2
Fulton	5:00 - 6:00	I-85	SB	SR 400 - I-20	6.0	21	17.9	>10	#2	top 10	top 5
Cobb	5:00 - 6:00	I-75	NB	I-285 - CHASTAIN RD	12.2	35	23.0	>10	top 5	#2	top 5
Fulton	6:00 - 7:00	SR 400	NB	GLENRIDGE PERIMETER CONN. - NORTHRIDGE RD	5.7	25	14.1	>5	top 5	top 10	#1
Forsyth	5:00 - 6:00	SR 400	NB	WINDWARD PARKWAY - SR 141 (PEACHTREE PKWY)	7.1	35	13.7	>5	top 5	top 5	#1
Cobb	5:00 - 6:00	I-575	NB	I-75 - BELLS FERRY RD	3.8	26	8.8	>5	top 10	NR	top 10
Fulton	5:00 - 6:00	I-75	NB	SR 10 (FREEDOM PKWY) - I-85	2.3	34	6.6	>3	top 10	NR	top 20
Gwinnett	4:00 - 5:00	I-85	NB	I-285 - INDIAN TRAIL LILBURN RD	5.4	35	9.2	>3	top 10	top 5	top 5
Cobb	5:00 - 6:00	I-285	WB/SB	NORTHSIDE DR - PACES FERRY RD	4.2	39	6.7	<3	top 10	top 5	top 10
Gwinnett	5:00 - 6:00	SR 316	EB	SR 120 (DULUTH HWY) - WALther BLVD	0.6	13	2.8	<3	top 10	top 20	top 20
Clayton	5:00 - 6:00	I-75	SB	I-285 - SR 331 (FOREST PKWY)	0.8	20	2.4	<3	top 20	top 20	top 20
Dekalb	5:00 - 6:00	I-20	EB	I-285 - PANOLA RD	3.2	42	4.6	<3	top 20	top 10	top 20
Henry	4:00 - 5:00	I-75	SB	I-675 - JODECO RD	5.3	48	6.6	<3	top 20	top 10	top 10
Fulton	4:00 - 5:00	I-285	SB	SR 280 (SOUTH COBB SR) - I-20	4.6	49	5.8	<3	top 20	top 20	top 20
Dekalb	5:00 - 6:00	US 78	EB	SR 236 (HUGH HOWELL RD) - PARK PLACE BLVD	1.8	38	2.8	<3	top 20	top 20	top 20
Fulton	5:00 - 6:00	I-75/I-85	SB	I-75/I-85 MERGE - US 29 (NORTH AVE)	1.3	38	2.4	<3	top 20	top 20	top 20
Fulton	5:00 - 6:00	I-85	NB	I-75 - SR 400	2.2	41	3.2	<3	top 20	NR	top 20
Fulton	5:00 - 6:00	SR 400	SB	ABERNATHY RD - I-285	1.5	38	2.4	<1	top 20	top 20	top 10
Dekalb	5:00 - 6:00	I-285	NB	I-20 - SR 260 (GLENWOOD RD)	1.7	43	2.4	<1	top 20	NR	NR
Gwinnett	5:00 - 6:00	SR 316	EB	I-85 - SUGARLOAF PKWY	2.0	46	2.6	<1	top 20	NR	NR

Figure 1.5 Ranking of Congested Freeway Zones (two-hour duration) / Morning and Evening 2010

2-HOUR DURATION CONGESTED ZONES							EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	2010 RANK AM
PERIOD: MORNING (AM)	ROUTE	DIR	CONGESTED ZONE (from) (to)	DIST (miles)						
7:30-9:30	I-75/I-85	NB	SR 166 (Lakewood Fwy) to I-20	3.6	21	10.4	>5 min.			tie #1
6:30-8:30	I-85	SB	SR 120 (Duluth Hwy) to Beaver Ruin Rd	3.7	22	10.5	>5			tie #1
7:30-9:30	I-285	NB/EB	US 41 (Cobb Pkwy) to Northside Dr	2.7	21	8.4	>5			top 5
7:30-9:30	SR 400	SB	Mansell Rd to Holcomb Bridge Rd	1.4	17	4.9	>3			top 5
7:30-9:30	I-75	SB	I-575 to N. Marietta Pkwy	2.9	31	5.8	<3			top 5
6:30-8:30	I-575	SB	Bells Ferry Rd to Chastain Rd	1.2	21	3.4	<3			top 10
7:30-9:30	SR 141	SB	Winters Chapel Rd to I-285	1.7	28	3.8	<3			top 10
6:30-8:30	I-575	SB	Towne Lake Pkwy to SR 92	1.2	23	3.1	<3			top 10
7:30-9:30	I-285	NB/WB	Chamblee -Tucker Rd to SR 13	1.7	31	3.3	<3			top 10
7:30-9:30	I-575	SB	Barrett Pkwy to I-75	1.0	29	2.1	<3			top 10
EVENING (PM)										PM
5:00-7:00	I-75/I-85	SB	I-75,I-85 merge to SR 10 (Memorial Dr)	4.9	20	13.7	>5			#1
5:00-7:00	I-285	EB/SB	Peachtree Rd to Chamblee-Tucker Rd	3.5	21	10.7	>5			#2
5:00-7:00	SR 400	NB	Glenridge Perimeter Conn. to Abernathy Rd	2.1	21	6.8	>3			top 5
5:00-7:00	I-75/I-85 HOV	SB	I-75,I-85 merge to 10th St	0.6	27	1.4	<1			top 5

Figure 1.6 Ranking of Congested Freeway Zones (three-hour duration) / Morning and Evening 2010

3-HOUR DURATION CONGESTED ZONES							EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	2010 RANK AM
PERIOD: MORNING (AM)	ROUTE	DIR	CONGESTED ZONE (from) (to)	DIST (miles)						
6:30-9:30	I-575	SB	Barrett Pkwy to I-75	1.0	30	2.0	<3 min.			#1
EVENING (PM)										PM
4:00-7:00	I-75/I-85	SB	I-75,I-85 merge to SR 10 (Memorial Dr)	4.9	23	12.0	>5			#1
4:00-7:00	I-285	EB/SB	SR 141 (Peachtree Ind. Blvd) to Chamblee-Tucker Rd	3.5	24	9.1	>5			#2
4:00-7:00	SR 400	NB	Glenridge Perimeter Conn. to I-285	0.6	12	3.1	<3			top 5

Signalized arterial highway performance ratings and congested zone overview

The nature of a congested arterial zone is that it usually is comprised of a series of closely-spaced congested signalized intersections. For that reason, the density-based performance rating system used on freeways is not suitable for analysis of interrupted-flow traffic. Accordingly, a surrogate (non-HCM) level-of-service methodology has been used that rates traffic flow based on the size of vehicle groups moving along each segment and the degree of queuing present at signalized intersections (for methodology, see Traffic Quality on the Atlanta Regional Highway Network: VOLUME TWO: ARTERIALS (2010), Appendix A, as referenced on page two of this report). The most severely-congested arterial zones include those that most closely parallel the most severely congested freeway zones, or else carry traffic toward those corridors: US 41 through Kennesaw and Marietta (parallel to I-75); SR 120 approaching I-75 from the west through Marietta; SR 92 approaching SR 400 through Roswell from the west; and three arterials approaching SR 400 from the east: SR 140, SR 961 (Old Alabama Rd) and SR 120. While the barrier-nature of the Chattahoochee River indirectly affects all of those routes, it also directly generates severe local congestion near each of its bridges; to the north -- SR 947 (Johnson Ferry Rd), northeast -- SR 140, SR 141, SR 120 and SR 20; less severe congestion is found southwest in Douglas County on SR 6 and SR 166. Inside the I-285 perimeter, traffic winding along the narrow arterials through DeKalb County generated many successive bottleneck intersections, particularly along SR 236, SR 8, SR 10, SR 155 and SR 42. To the east, significance delays were incurred on US 78 through Snellville, and to the northeast on SR 316 through Lawrenceville. Delays were generally less severe to the south; however, major bottlenecks were found along many of the signalized state arterials approaching the vicinity of I-285 (SR 279, SR 314, SR 139, SR 85 and SR 3). The bottleneck maps on the following pages provide an overview of each surveyed arterial corridor; specific details of each congested zone can be found in the technical report named above or on the web site module described on page two.

Bottleneck inventory maps (Sections 1.2 and 1.3)

Section 1.2: Morning bottleneck inventory maps:

- central region (I-285 perimeter), pp 12-13;
- northwest region, pp. 14;
- north region, pp. 16;
- northeast region, pp. 18-19;
- east region, pp. 20-21;
- south and southeast regions, pp. 22-23;
- west and southwest regions, pp. 24

Section 1.3: Evening bottleneck inventory maps:

- central region (I-285 perimeter), pp 28;
- northwest region, pp. 30;
- northeast region, pp. 32-33;
- east region, p. 34;
- south and southeast regions, pp. 36-37;
- west and southwest regions, p. 38

Figure 1.7 Region Designations for the Bottleneck Maps

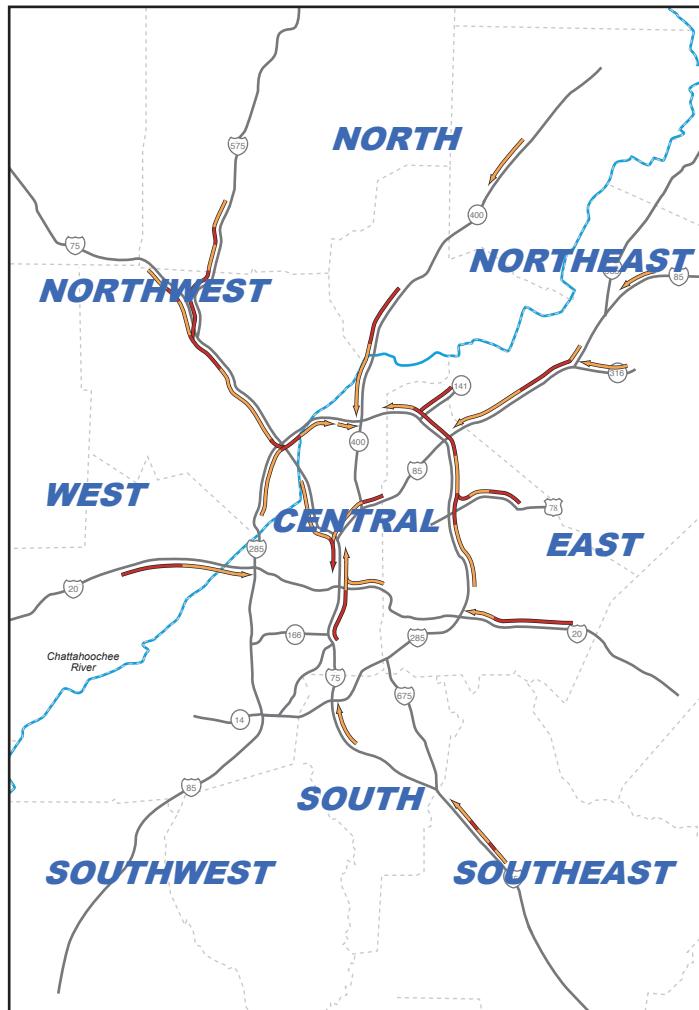
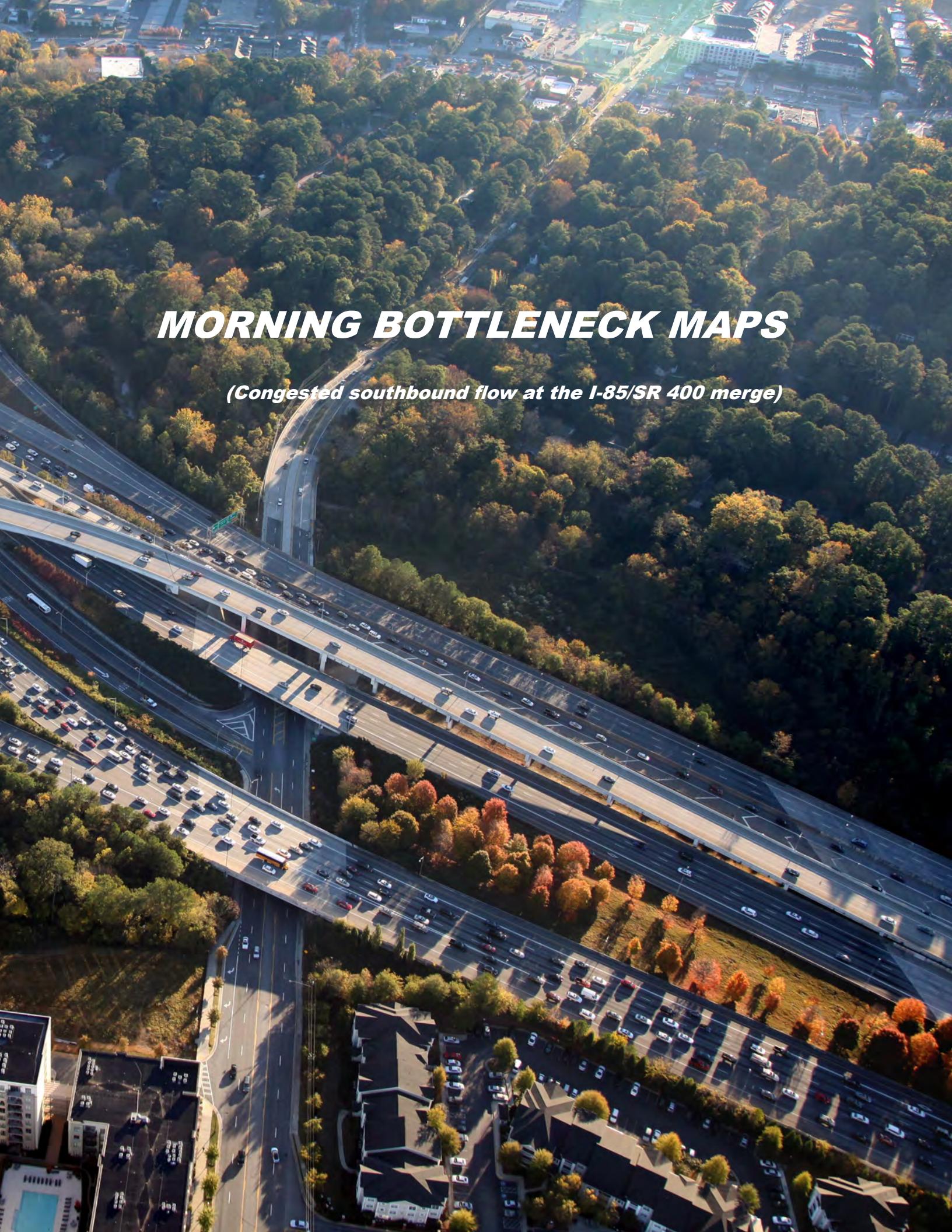


Figure 1.8 Legend for Bottleneck Maps

Current Traffic Conditions:	Legend for Bottleneck Maps
CONGESTED:	
MARGINALLY CONGESTED:	
NOT CONGESTED:	(No Arrow)

The next two sections present a map-based bottleneck inventory of the region, including both freeway and arterial routes. Congestion with greater severity and higher frequency is represented by red arrowheads; less-severe or intermittent congestion is represented by orange arrowheads. The predominant directions of commuter “tidal flows” are evident in these maps, as well as areas where “feeder” or parallel arterial corridors are most affected by congestion. The sources of data for these bottleneck maps were the surveys conducted in the spring and fall of 2010. More information about each bottleneck is also available through the interactive resource on the GDOT website. Representative aerial photographs have been presented with the maps; the entire archive of highlight aerial bottleneck photography is available for viewing through the website (see page two discussion under “Web-based Interactive Resource” for link).

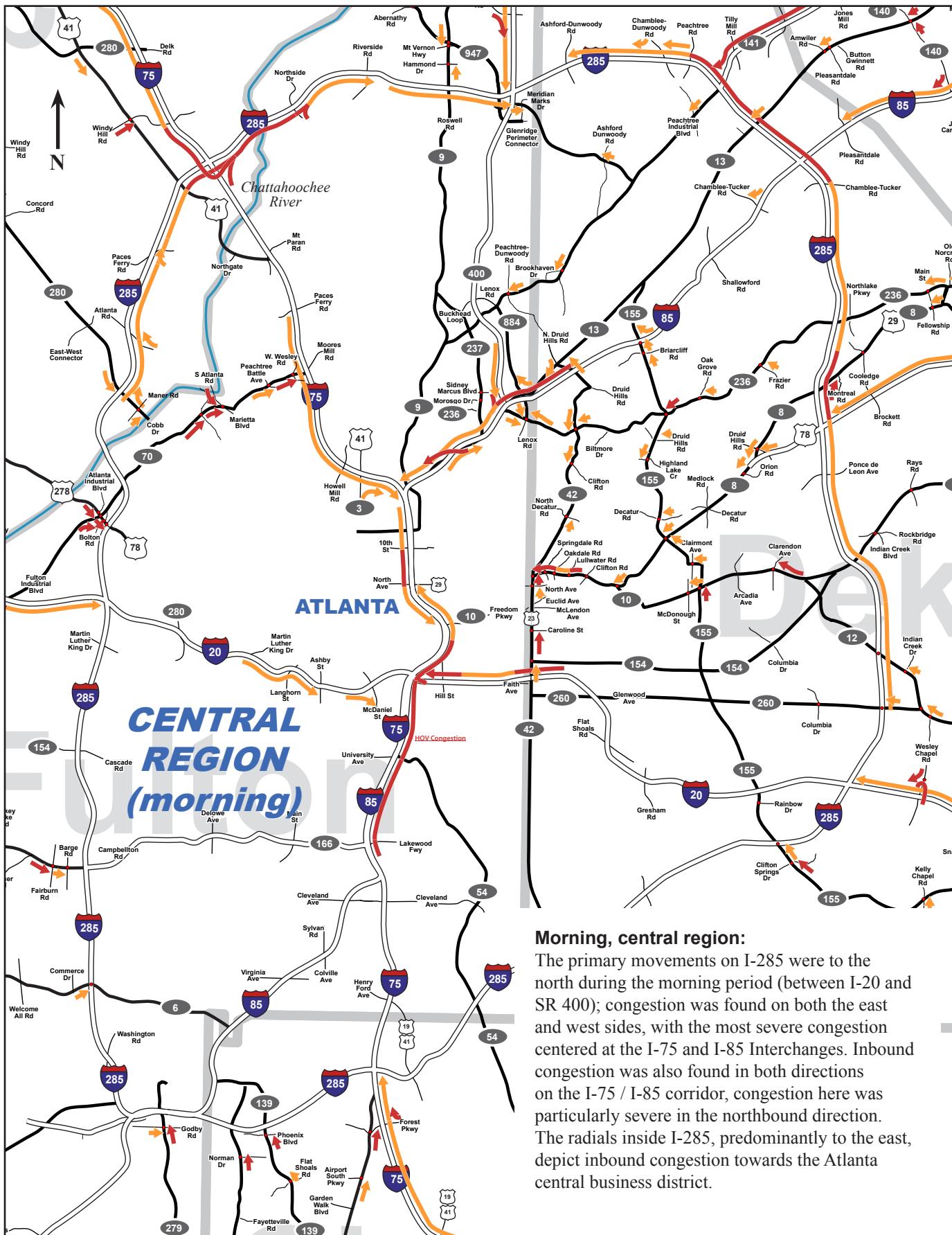


An aerial photograph of a complex highway interchange. A multi-level overpass dominates the left side of the frame, with several lanes of traffic moving along its spans. Below the overpass, a major road with multiple lanes of traffic extends towards the bottom right. The area is densely surrounded by a mix of green and autumn-colored trees. In the far background, a city skyline with various buildings is visible.

MORNING BOTTLENECK MAPS

(Congested southbound flow at the I-85/SR 400 merge)

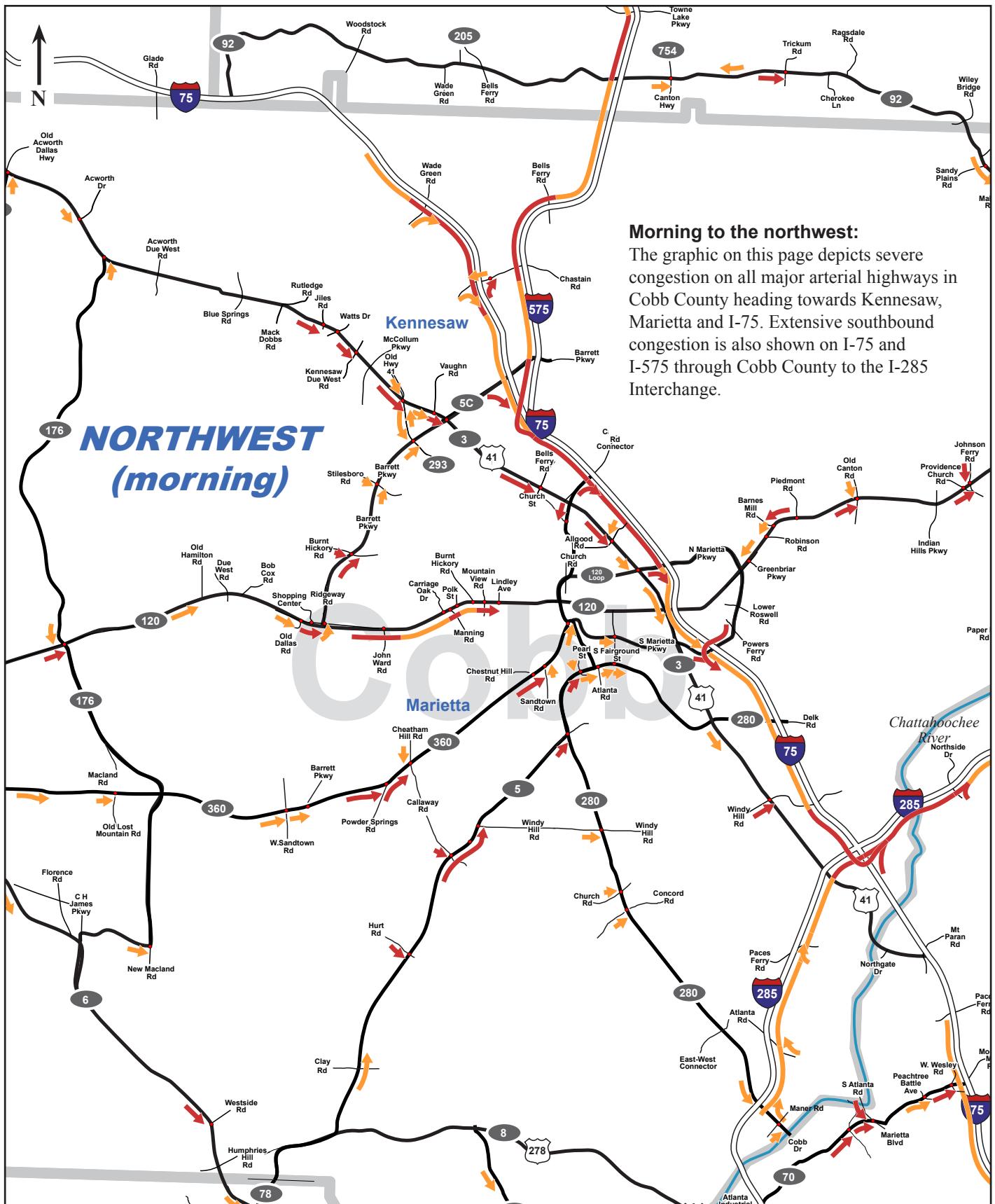
Section 1.2: Morning Bottleneck Inventory Maps, 2010



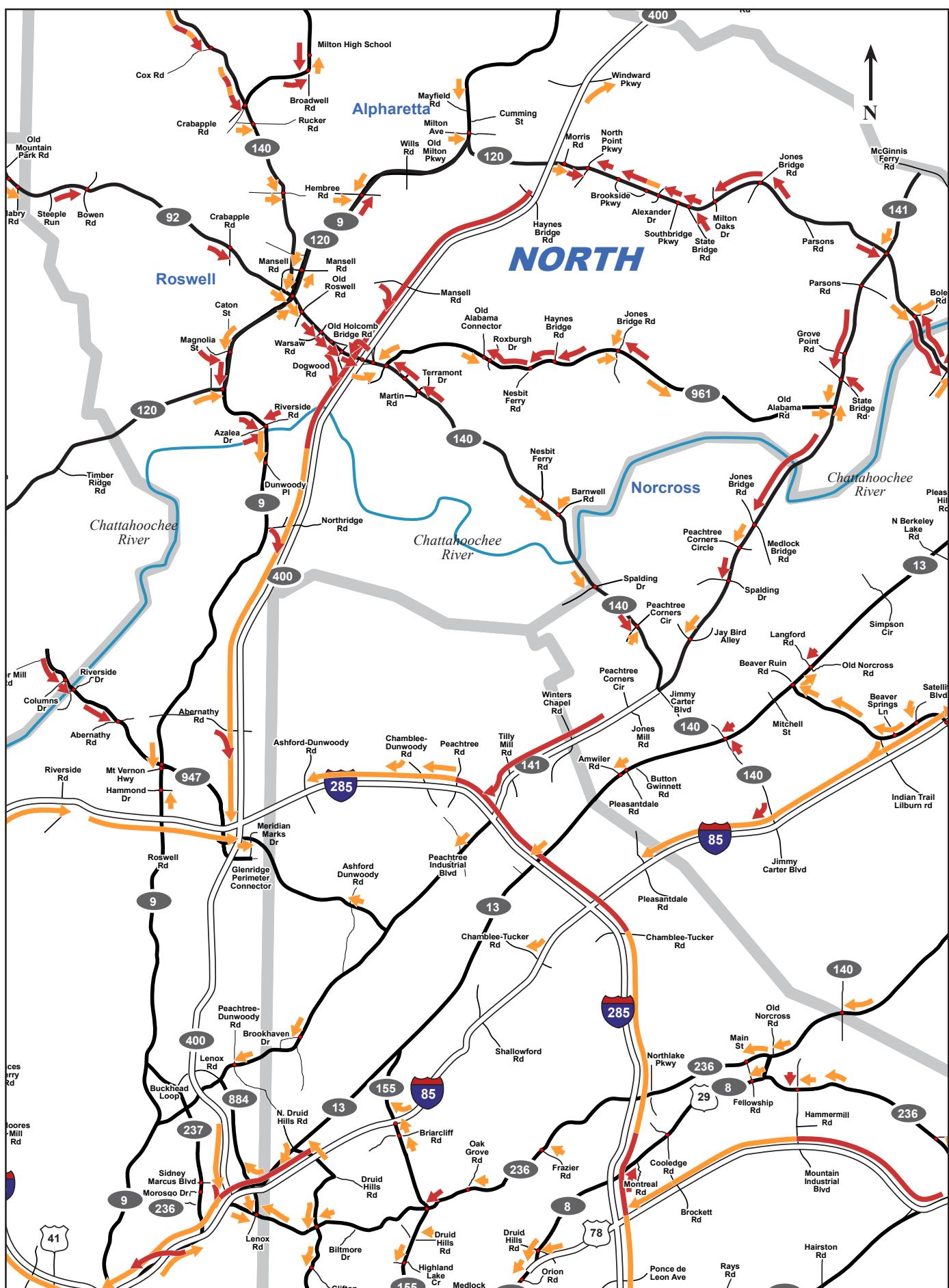
Morning, central region:

The primary movements on I-285 were to the north during the morning period (between I-20 and SR 400); congestion was found on both the east and west sides, with the most severe congestion centered at the I-75 and I-85 Interchanges. Inbound congestion was also found in both directions on the I-75 / I-85 corridor, congestion here was particularly severe in the northbound direction. The radials inside I-285, predominantly to the east, depict inbound congestion towards the Atlanta central business district.

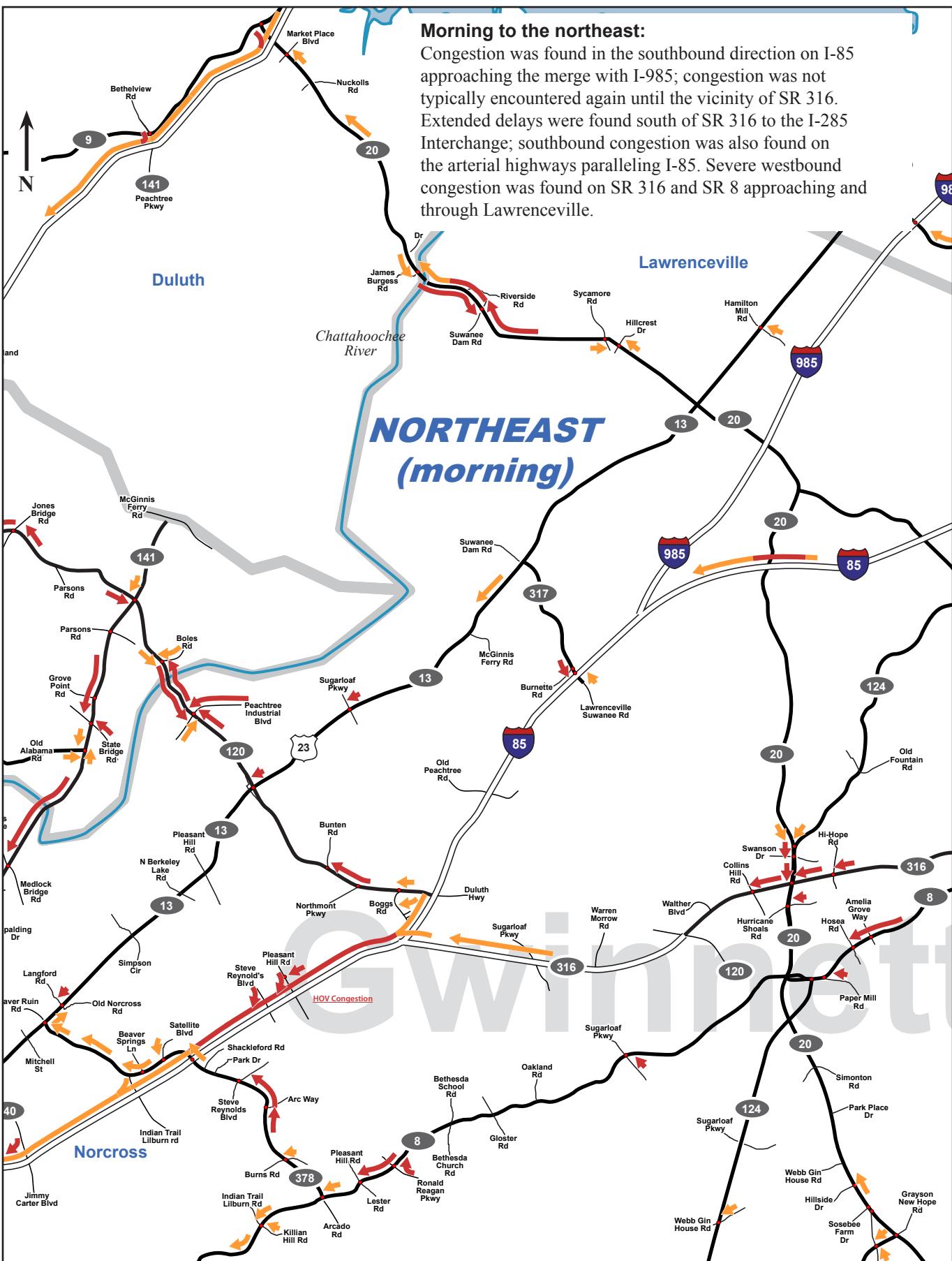




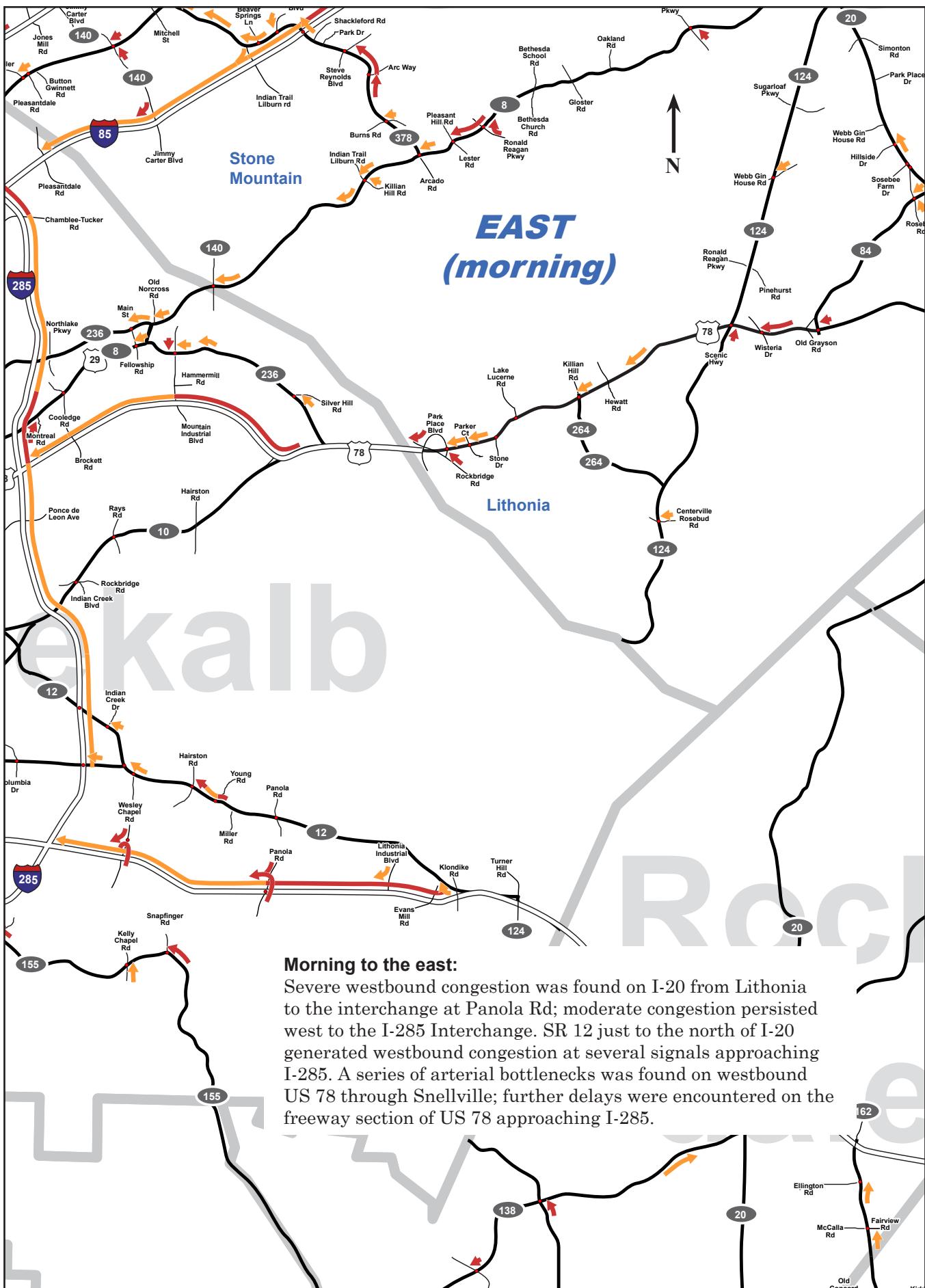




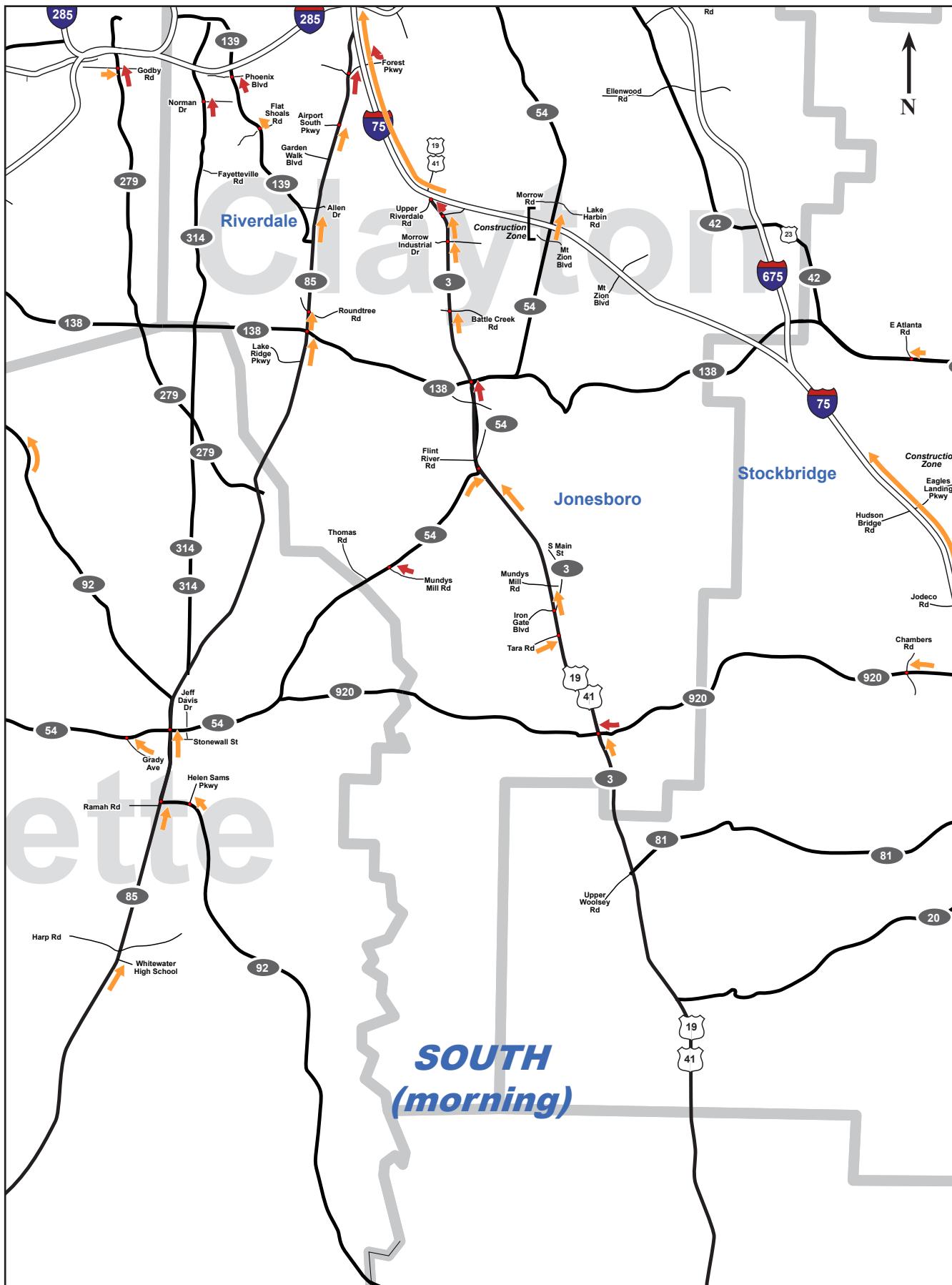














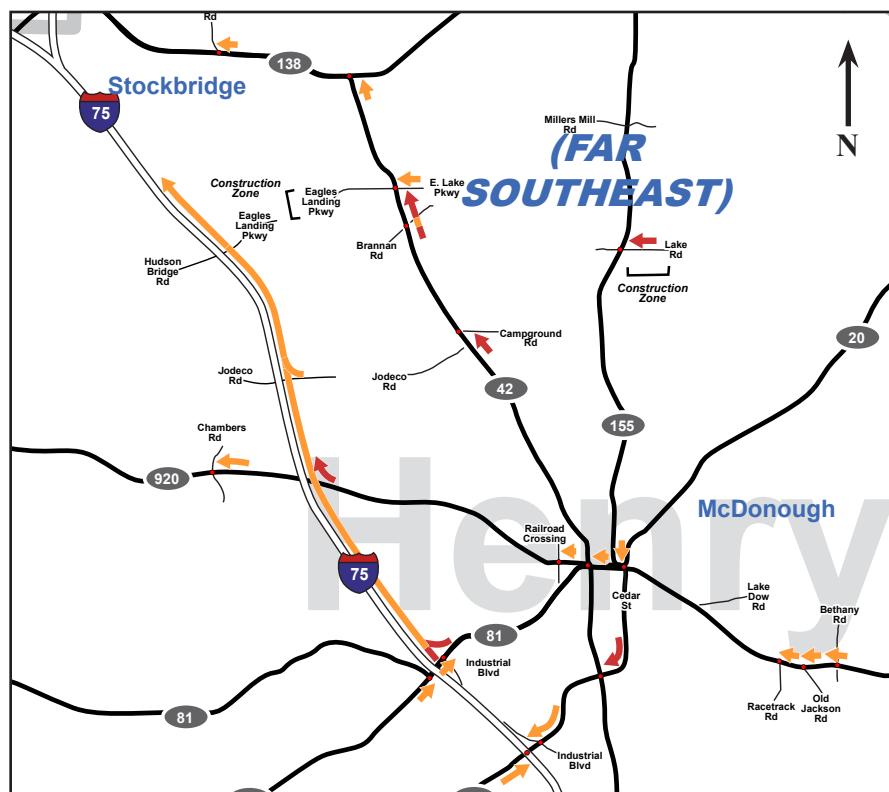
(Above) Northbound congestion on I-75 at SR 920 (Jonesboro Road).

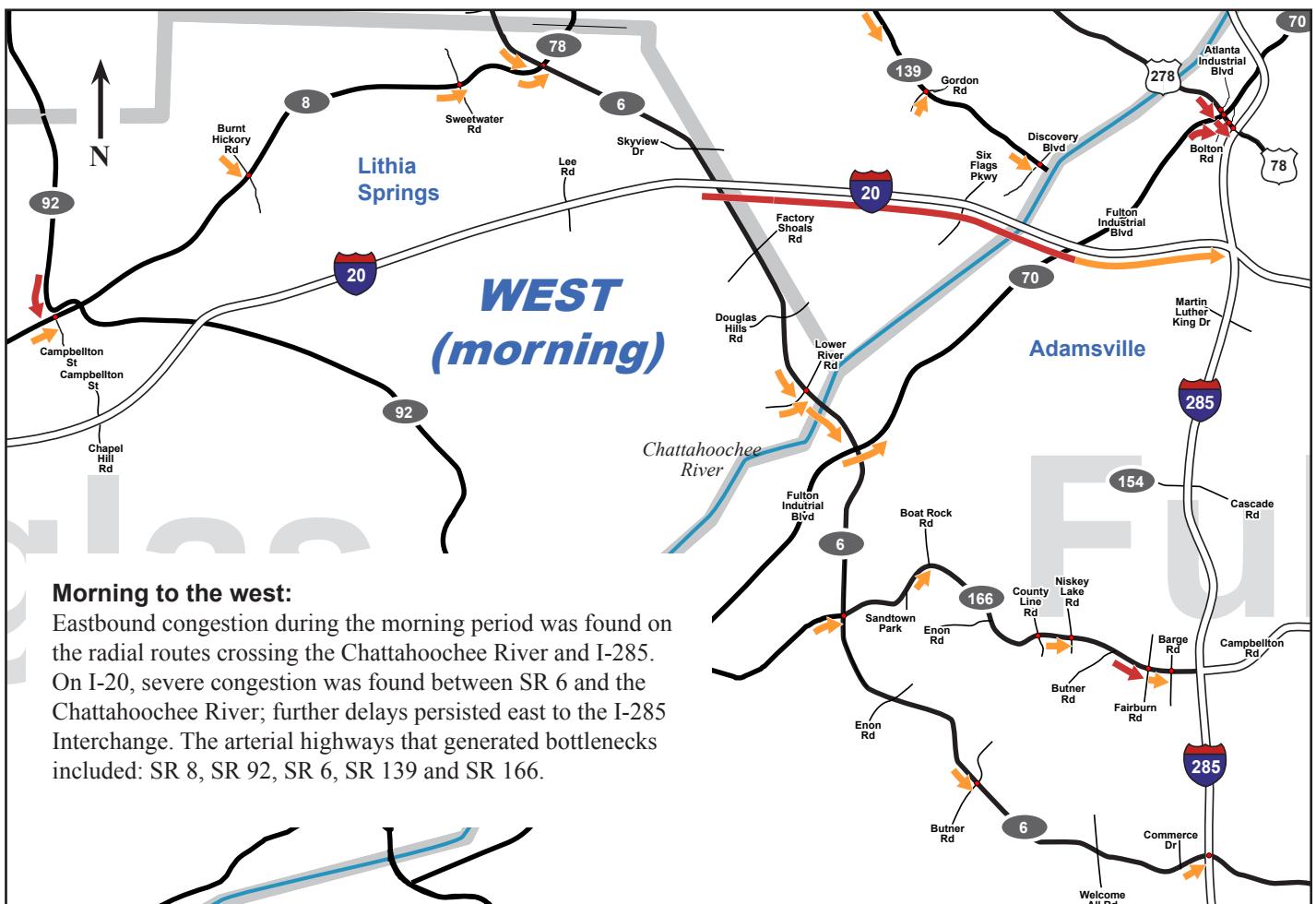
Morning to the south:

On I-75, northbound congestion was found between McDonough and I-675, and again approaching I-285; northbound travelers on I-675 did not encounter congestion during the morning period. Northbound congestion was found at multiple signals along the radial arterials located between I-85 and I-75; congestion was more pronounced closer to I-75 and I-285.

Morning to the far southeast:

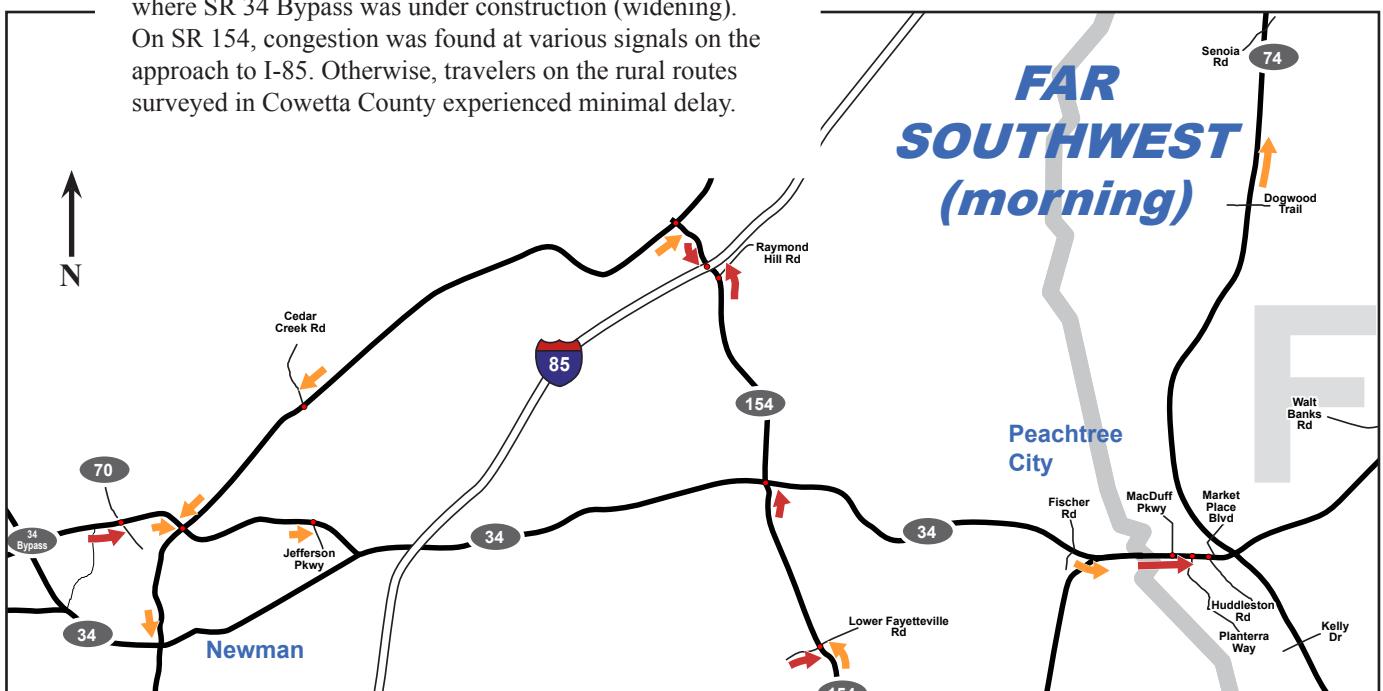
Minor congestion was found on various arterial routes approaching McDonough. North of McDonough, several signalized intersections on SR 42 generated congestion (northbound).





Morning to the far southwest:

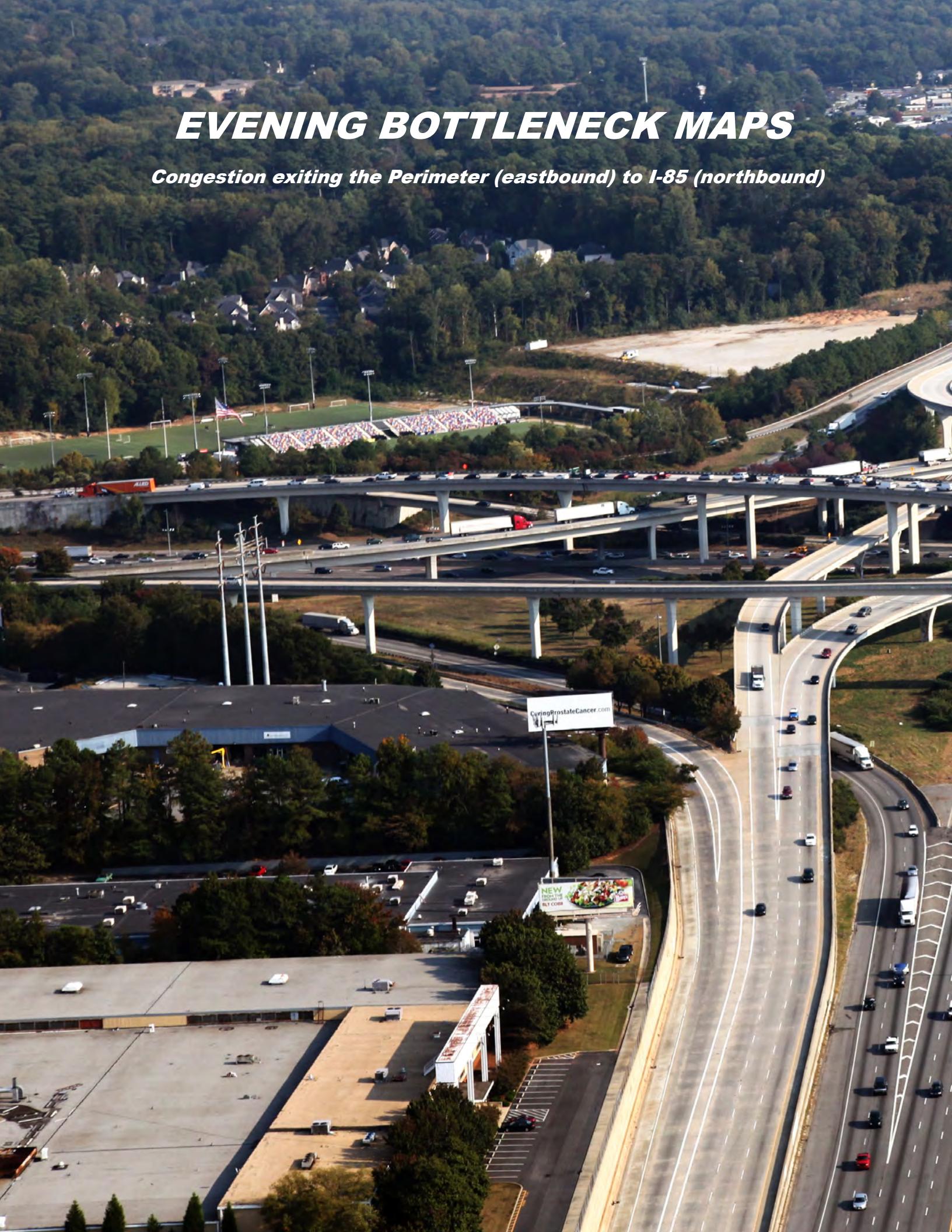
Arterial bottlenecks were found in Newman, primarily where SR 34 Bypass was under construction (widening). On SR 154, congestion was found at various signals on the approach to I-85. Otherwise, travelers on the rural routes surveyed in Coweta County experienced minimal delay.





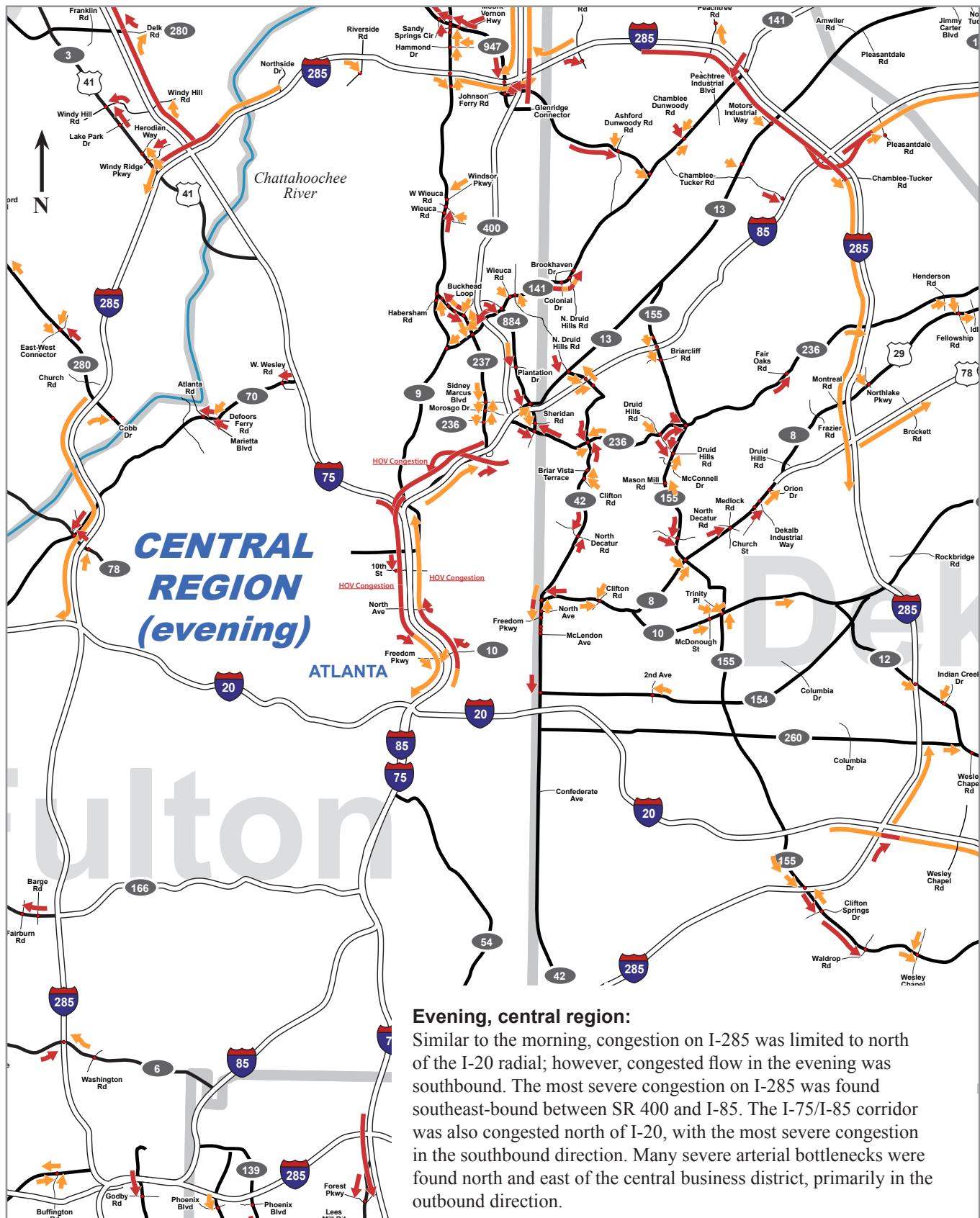
EVENING BOTTLENECK MAPS

Congestion exiting the Perimeter (eastbound) to I-85 (northbound)

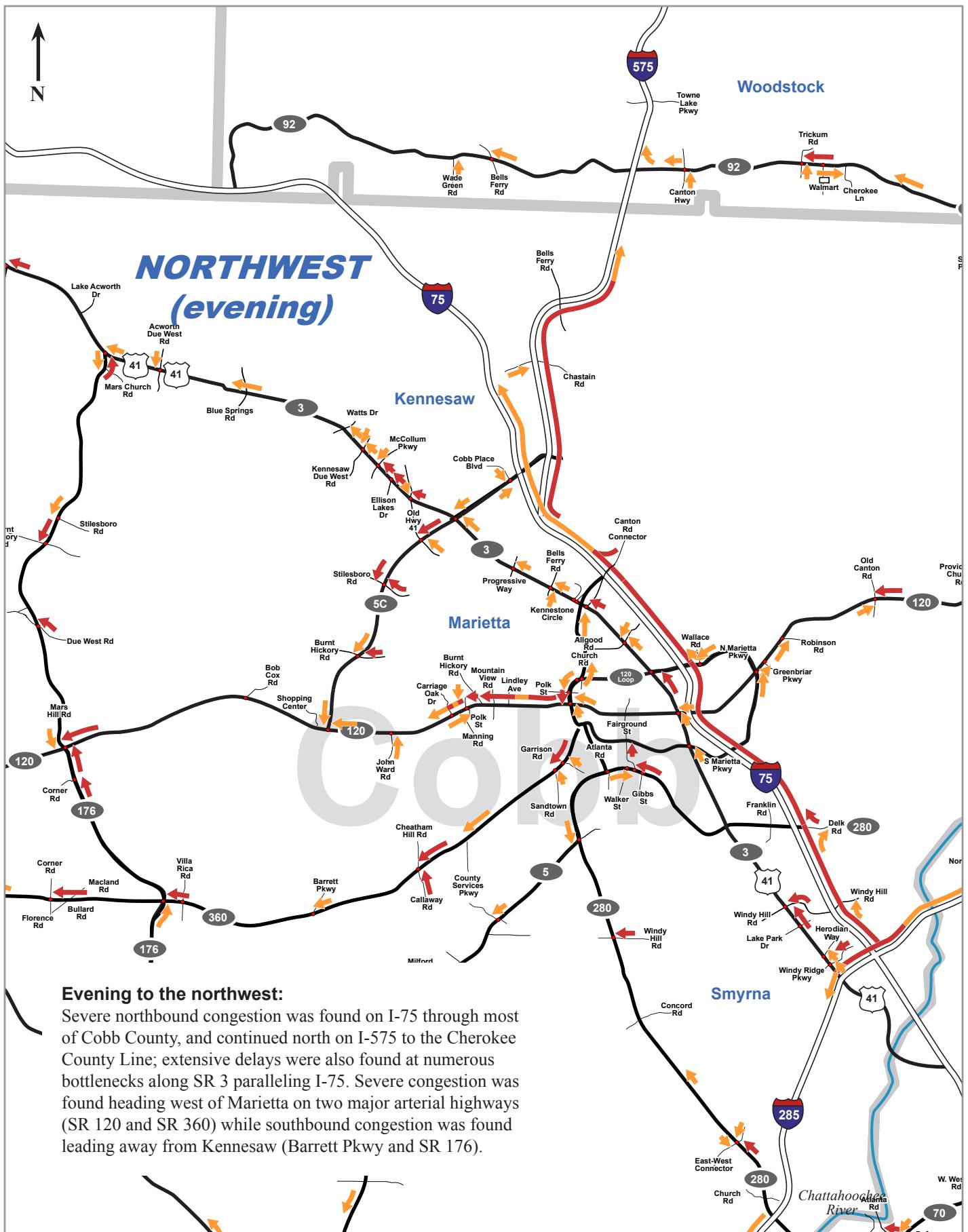




Section 1.3: Evening Bottleneck Inventory Maps, 2010



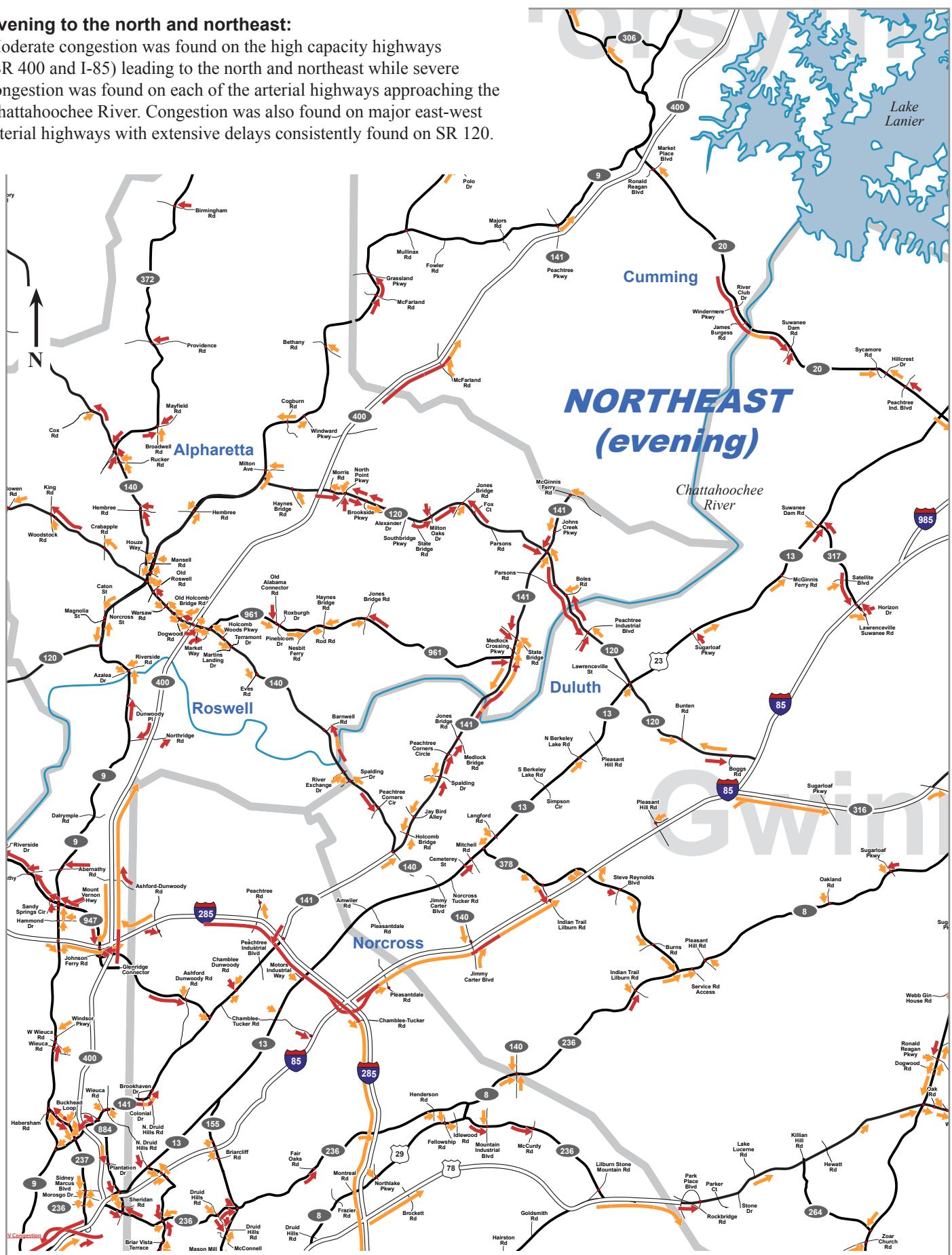


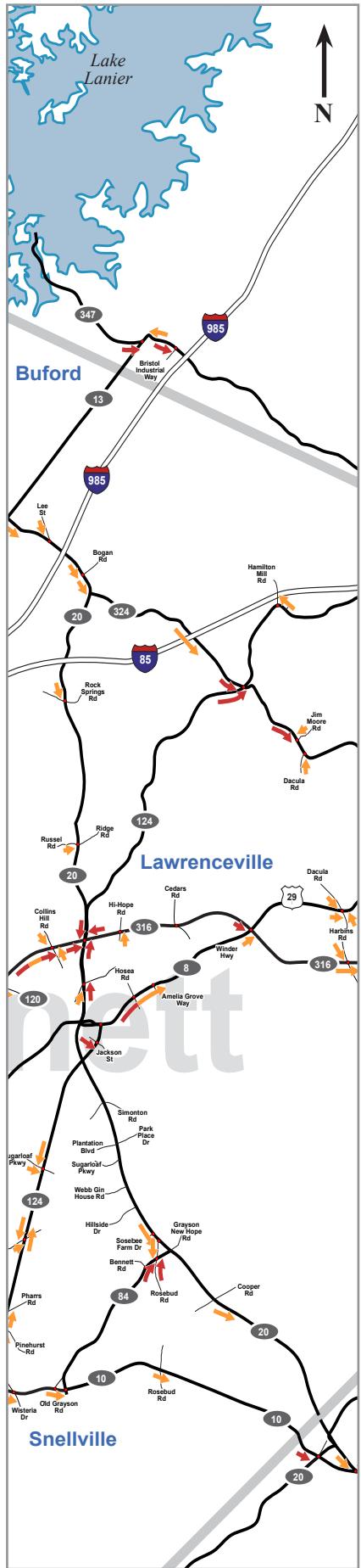




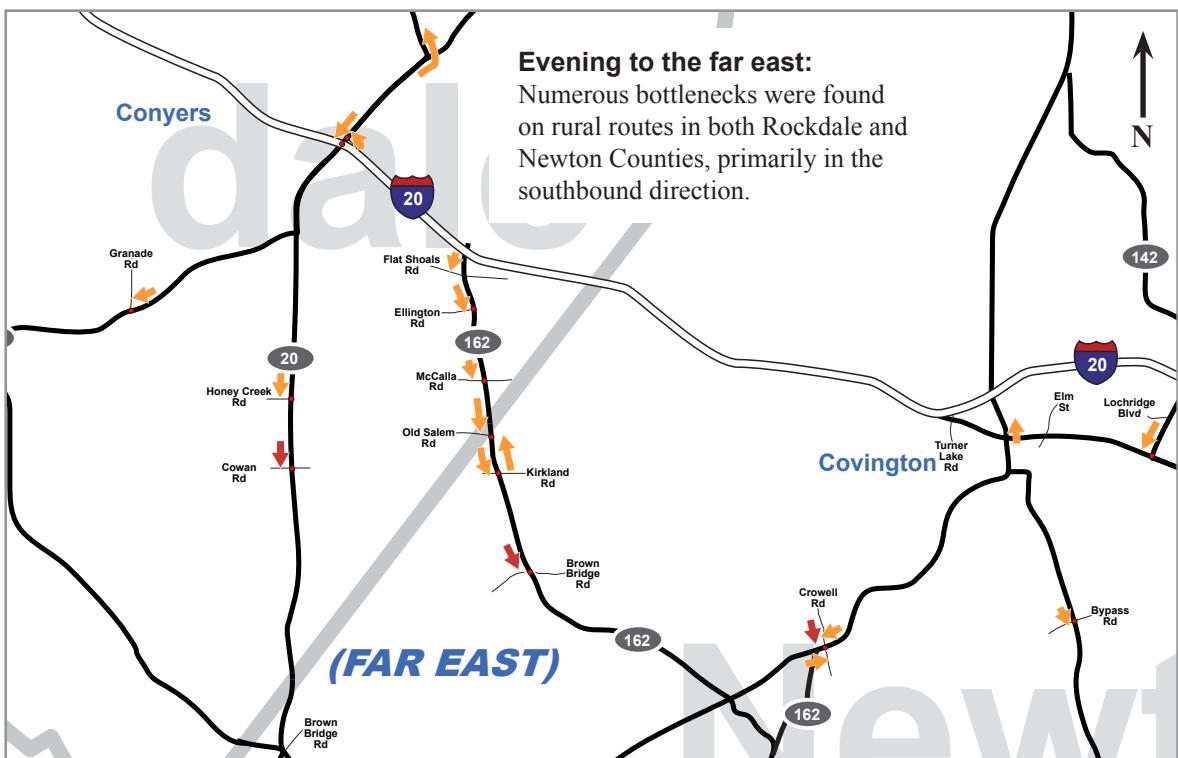
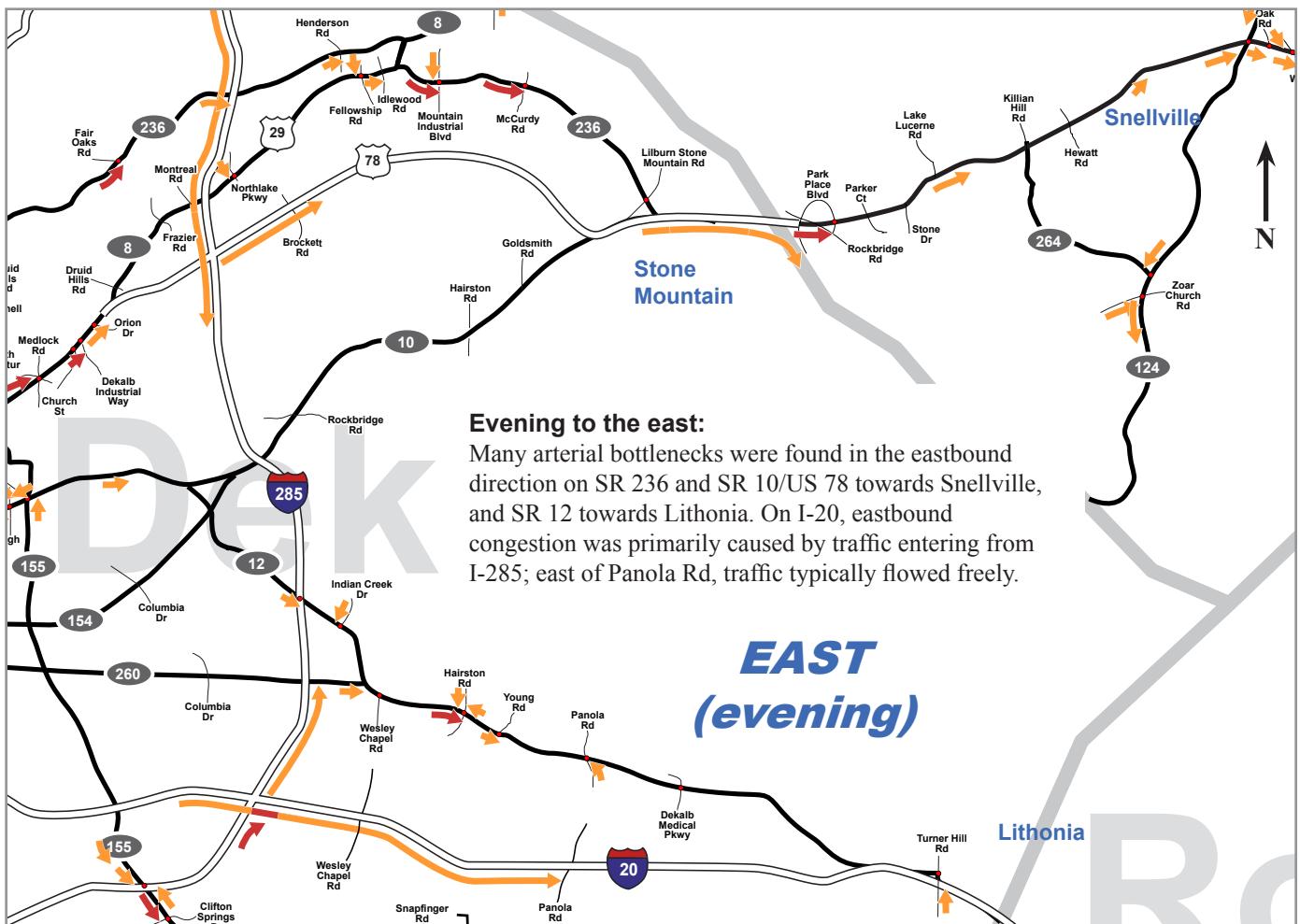
Evening to the north and northeast:

Moderate congestion was found on the high capacity highways (SR 400 and I-85) leading to the north and northeast while severe congestion was found on each of the arterial highways approaching the Chattahoochee River. Congestion was also found on major east-west arterial highways with extensive delays consistently found on SR 120.

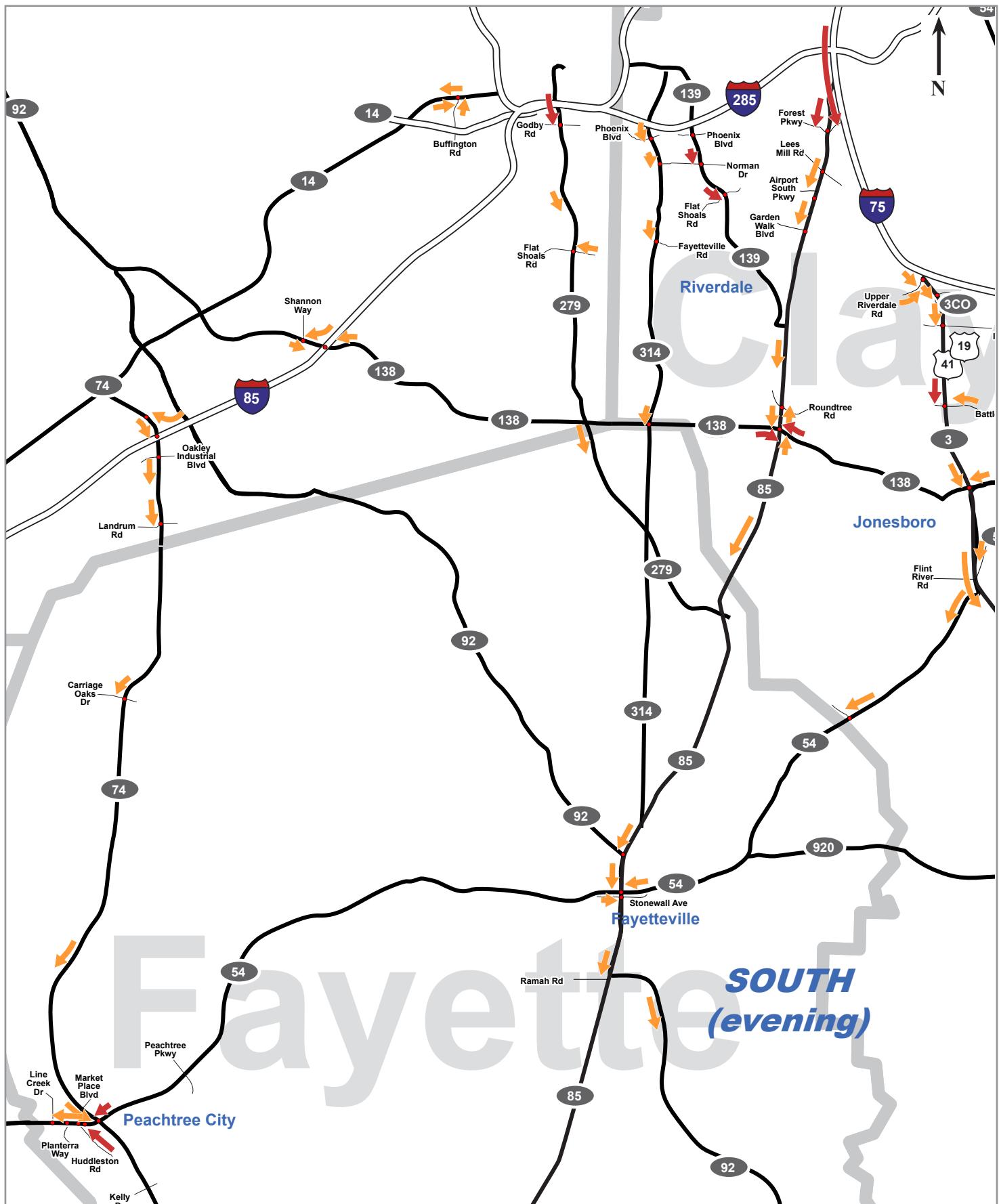


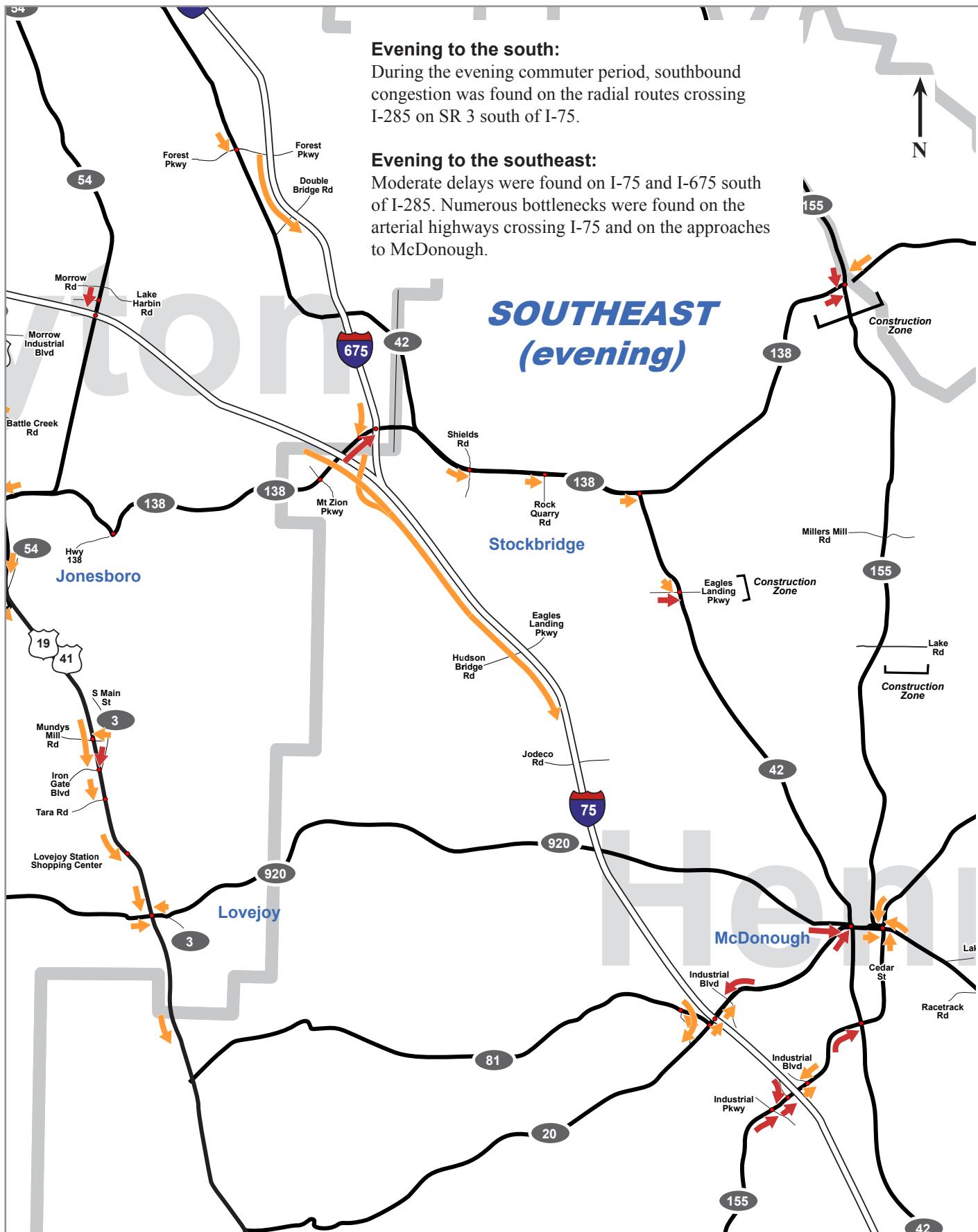


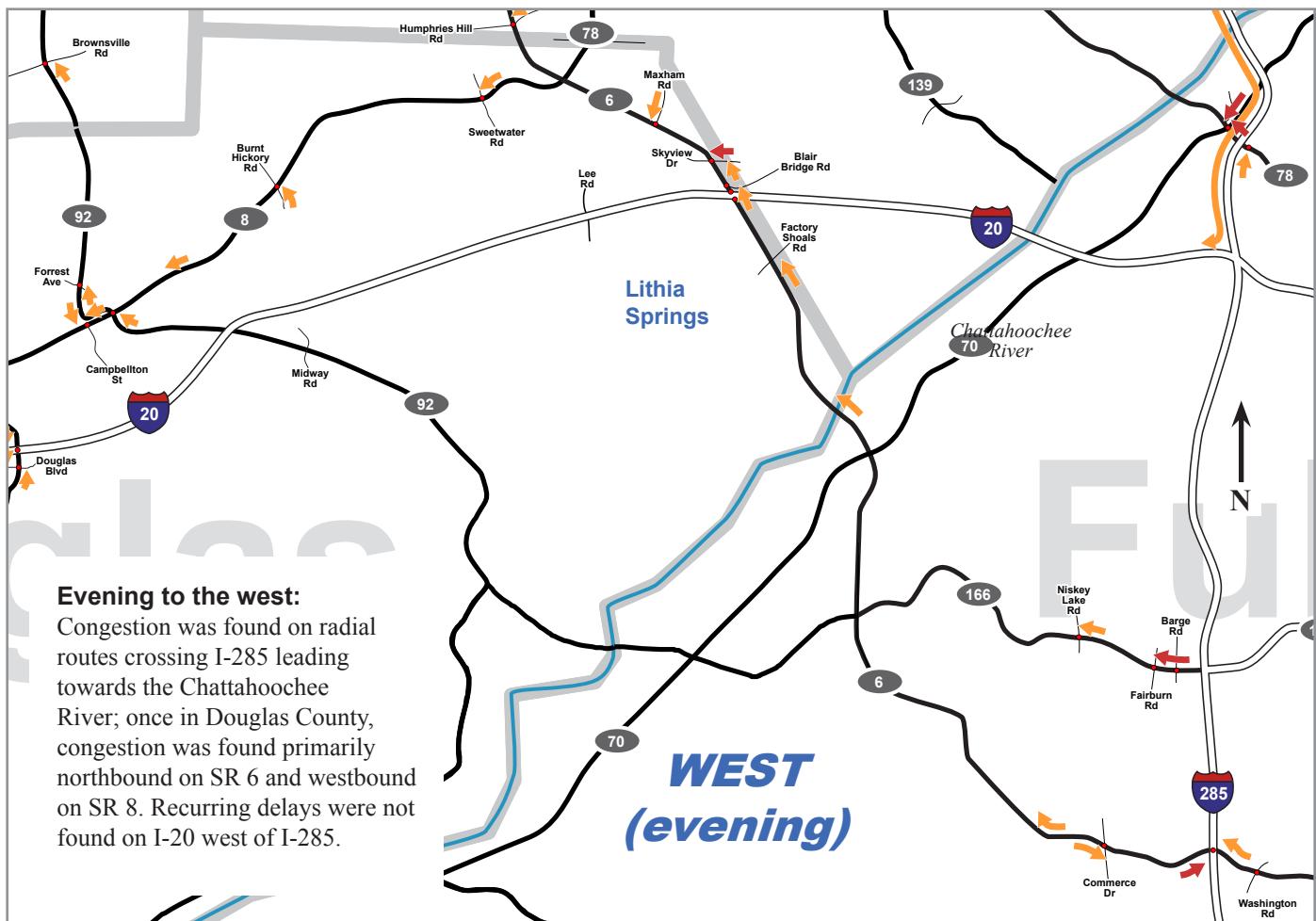
(Above) Northbound congestion on I-85 at SR 140 (Jimmy Carter Blvd), looking northeast.

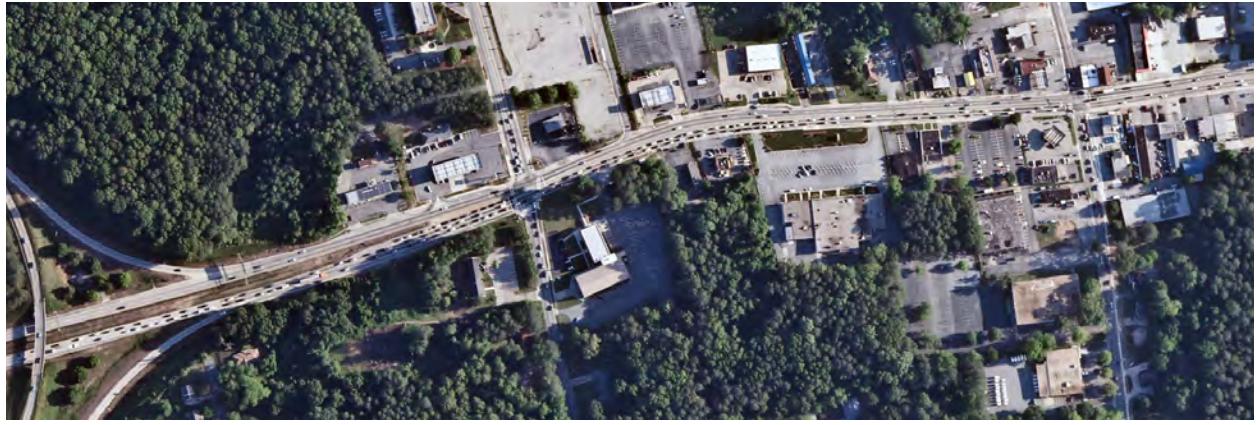












(Above) Westbound congestion on SR 166 at Barge Rd and Fairburn Rd; the I-285 Interchange is at the left edge of the photo.



(Above) Westbound congestion on the SR 34 Bypass at SR 14.

PART TWO / COMPARISON: Bottleneck Changes, 2010 Update

Part Two reviews the nature of system-wide congestion on large metro-area highway systems, and notes how transportation agencies work to preserve or improve mobility in the face of steady growth. Next it examines mobility trends in the metro-Atlanta area, and then discusses the degree to which mobility changes can be accounted for by recently completed improvement projects.

The balanced nature of highway mobility and congestion in large metropolitan areas

Ordinary recurring congestion is essentially the queuing of vehicles waiting to be served. Some degree of delay is acceptable to drivers as the price to pay for living or working where they want to, using a convenient transportation mode (single-occupancy automobile for the majority), or traveling at preferred times. When delays become unacceptably long, drivers choose which conveniences to give up: some will time their trips to avoid the peak hour; some will switch to car pools or transit; others may even decide to reside closer to work. The collective outcome of these choices is the maintenance of a daily balance between the number of vehicles being served at any given time and the number of vehicles delayed in queues.

Since the mass production of automobiles began almost 100 years ago, demand for space on the highway system has grown steadily. Ever-increasing numbers of vehicles have forced drivers to adjust to ever-greater delays. Public agencies have responded over time with programs to build new highways or add travel lanes, increase efficiency of existing lanes, provide modal alternatives such as HOV lanes or expanded transit, or provide incentives to travel during off-peak hours. The underlying objective of these programs has not been to mitigate all congestion, but to commit financial resources wisely to reduce congestion or preserve mobility where possible. Performance monitoring programs such as this one provide not only input for general planning activities, but feedback regarding the effectiveness of congestion-mitigation investments.

Trends in the metro-Atlanta planning region

In 2002 the Georgia Regional Transportation Authority (GRTA) began to publish annual travel time index values that are used to help understand general congestion trends on the freeway system. (The data source is the NaviGATOR camera-based system on major freeway links in the area.) From 2002 through 2006, these travel time index values indicated that congestion was gradually increasing, consistent with a long-recognized trend and the general perceptions of the public. The multi-year recession that began in 2007 may have started the downward trend that was evident in the indexes; the plots show that levels continued to drop in 2008 and 2009, such that congestion was comparable to the levels measured in 2002 (2010 data not yet available; see Figure 2.1).

Figure 2.1 Freeway Travel Time Index

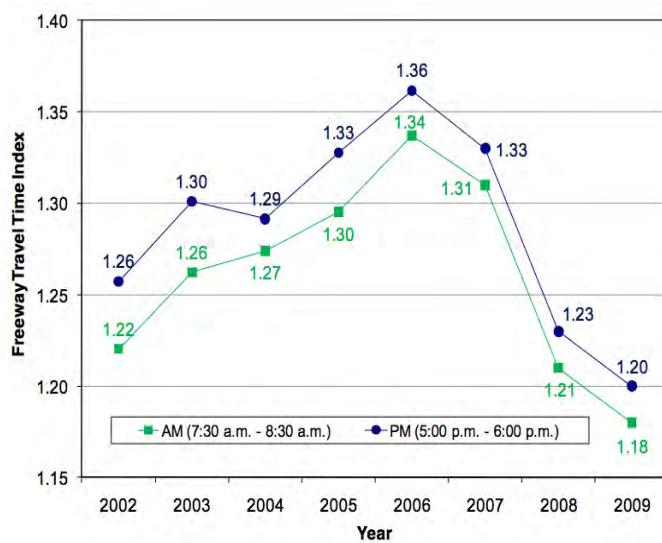


Figure 2.1: Freeway Travel Time Index by year, produced by the Georgia Regional Transportation Authority (2010 MAP Report, page ____).

Of course, this is just one way to look at general congestion levels. A second way is provided by the INRIX National Traffic Scorecard, which has been produced each year since 2006 by a private-sector collector and seller of real-time travel speed data for fleet management and use by the general public. In INRIX's 2010 Scorecard, travel time "tax" calculations for the Atlanta region are computed that are similar in nature to GRTA's travel time index, although generated by an entirely independent methodology (INRIX relies on spot-speeds reported by GPS-equipped vehicles flowing within freeway traffic streams). INRIX findings agreed with those from GRTA, that 2006 indeed was a peak year for congestion. INRIX also measured a minor improvement for 2007, and then a sharp improvement for 2008. (Similarly, during this three-year period, INRIX's national ranking of Atlanta-area congestion also recorded an improvement, from 8th-worst to 12th worst.)

The findings of the aerial survey program concur with the above two sources. From 2005 to 2007 to 2010, measurements of freeway congestion in the 22-county metro-Atlanta planning region decreased from 10.5% of the system to 8.7% to 7.5% (congestion defined as lane-mile-hours operating at LOS "F"). Likewise, arterial congestion decreased from 16.5% in 2005 to 14.5% in 2007, and then stayed about the same (14.4%) in 2010 (arterial congestion defined as lane-mile-hours operating at surrogate LOS "E" or "F").

Reasons for improvement: the recession and gasoline prices vs. investments to improve mobility

A commonly-accepted method to measure public demand for the highway system is to calculate the total vehicle-miles traveled on that system each year. While the 2010 totals have not yet been finalized, Figure 2.3 shows that, after many years of steady increases, demand peaked in 2004 and has been essentially level through 2009.

Figure 2.3 Vehicle-miles traveled, metro-Atlanta region

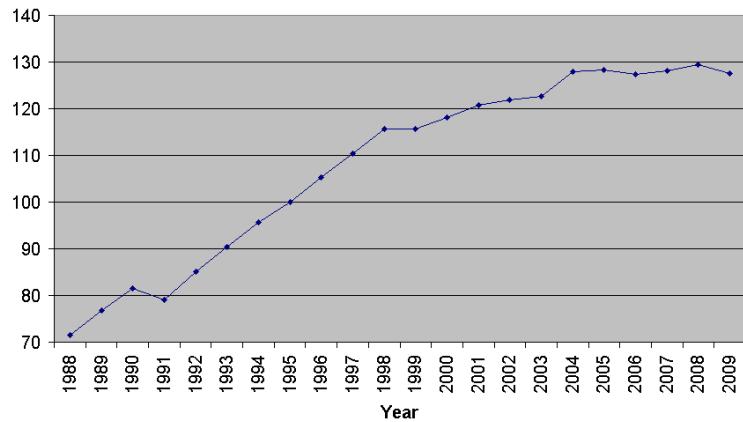


Figure 2.3: Annual vehicle-miles traveled in the 13-county metro-Atlanta air quality non-attainment region (2010 not yet available; source: Georgia Regional Transportation Authority and the Georgia Department of Transportation).

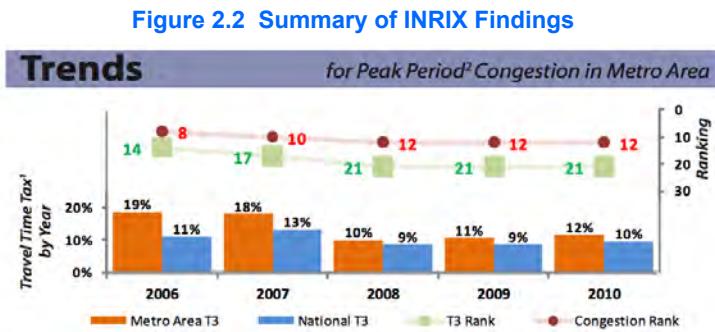


Figure 2.2: Summary of INRIX findings for the metro-Atlanta area freeways; the red numbers are Atlanta's national congestion severity rankings each year; similarly, the green numbers are INRIX's "travel-time tax" (T3) national rankings. (T3 is a measure that is similar in concept with GRTA's travel time index; 19% is how much extra time a driver will need for a trip under congested conditions compared to a trip without congestion). Therefore, the orange bars which depict T3 most closely match the GRTA plot; the same trend is evident – toward improving mobility – for 2006 through 2008; then conditions level off (and even climb slightly) through 2010. (The blue bars are national aggregates). Source: the 2010 INRIX National Traffic Scorecard.)

Could demand level have remained steady despite the recession that began in 2007 and concurrent fuel price volatility? For example, in its 2010 Scorecard, INRIX postulates that congestion improvements, both nationwide and in the Atlanta area, were largely a byproduct of the loss of regional jobs: the report cites statistics that indicate that non-farm employment in the Atlanta region decreased from 2.43 million jobs in 2006 to 2.27 million in 2010 (a 7% decline). It seems unquestionable that economic factors accounted to some degree for the observed mobility improvements.

However, another fact is inescapable: during the same time period, Georgia has invested in numerous projects to improve

mobility at bottlenecks throughout the 22-county metro-Atlanta region, on both freeways and arterials. The 2010 survey alone has identified over thirty sites where projects have been completed that have mostly or completely eliminated congestion (see before/after photos on the following pages). Another 20 projects were identified in the 2008 survey findings report. Accordingly, many routes are now rated at improved levels-of-service, the summation of which indicates that mobility has improved since the peak in 2004 and 2005.

In other words, regional commuters are benefiting on a daily basis from a comprehensive policy to invest in highway system mobility, and the ability to move about during peak travel periods is measurably better than it was in 2005.

2004



2007



2010



(Above) Infrastructure improvements and congestion mitigation on SR 92 at Wade Green Road in Cherokee County, between 2004 and 2010.

Section 2.1: Sites with improved mobility

This section presents many sites with improved mobility resulted directly from bottleneck elimination projects. These sites are presented with descriptions of what work was done, augmented with before-and-after aerial photographs that show the impact on traffic flow.

Section 2.1 presents many sites with improved mobility resulted directly from projects that eliminated bottlenecks. These sites are presented with descriptions of what work was done, augmented with before-and-after aerial photographs that show the impact on traffic flow.

Although logical reasons could not be found for all apparent changes, and although daily variations undoubtedly played a role in some cases, the objective was to report significant findings regardless of whether logical apparent causes could be identified.

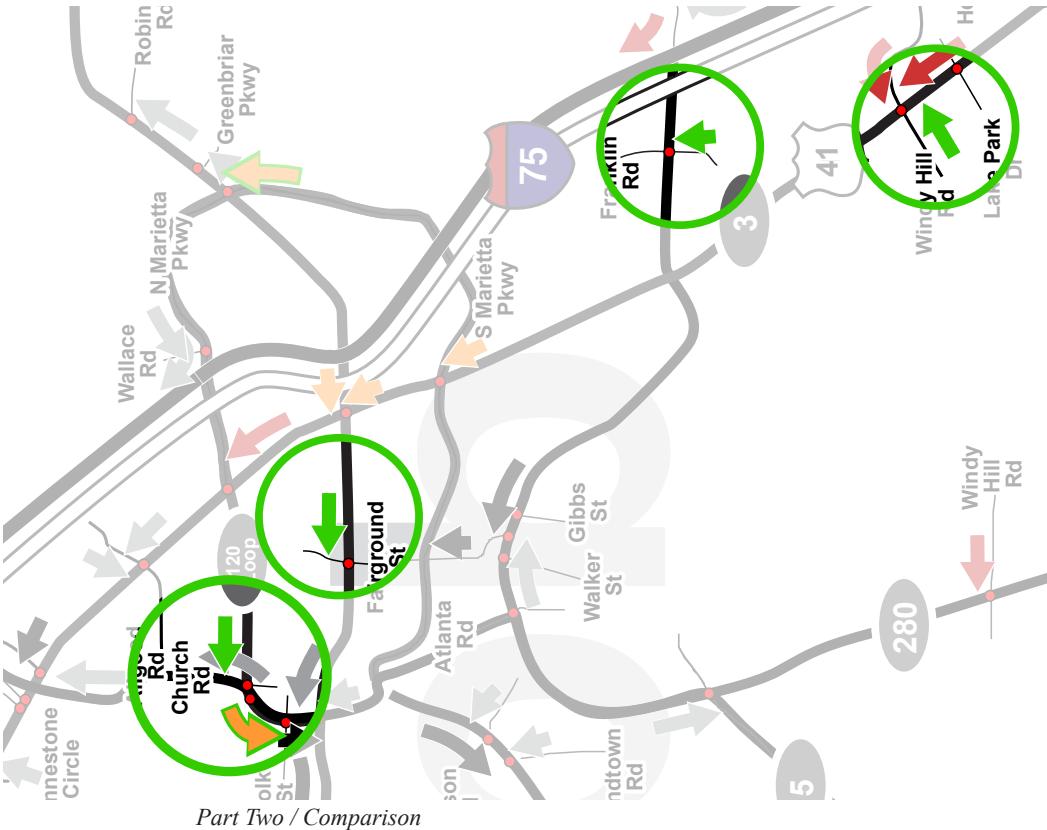
INTERPRETING THE MAP FORMAT IN PART TWO

The bottleneck maps presented in Part One have been converted to “Comparative Maps” for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2007/2008 and 2010. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found.

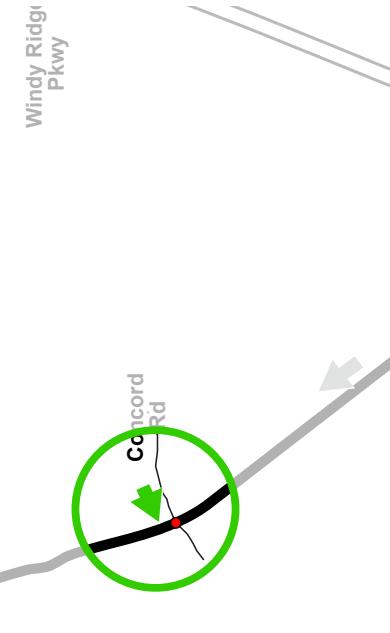
1) GREEN arrows have been added to depict where previous congestion was no longer found.

2) A special symbol was needed where previously severe congestion was partially mitigated to less-severe levels; ORANGE arrows with GREEN BORDERS were used in these situations.

The map insert to the left has examples of all of these types of arrows.



Part Two / Comparison



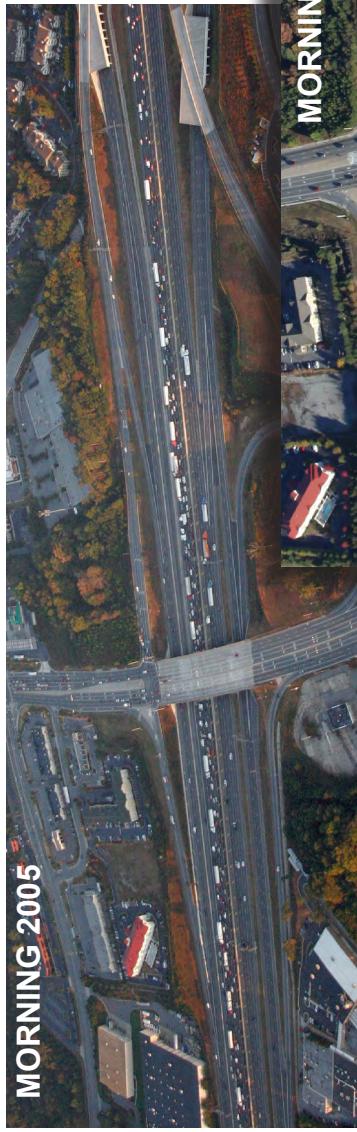


(Above: Atlanta is to the left) The five-lane bottlenecked weaving section of southbound I-85 shown above in the 2005 photo was replaced by 10 lanes that featured the merging of six homogeneous traffic streams into three (HOV, "through" and local; see description in the text below). Furthermore, SR 316 traffic headed for the Pleasant Hill Road exit now bypasses I-85 entirely (far top lane in 2010 photo).



SOUTHBOUND

MORNING 2005



SOUTHBOUND

MORNING 2010



SOUTHBOUND

(Above: I-85 at SR 120 (Duluth Highway) The downstream improvements have sharply reduced the length of the "tails" of the congested zones on each of the two approaches to the interchange. Prior to construction, severe daily congestion was usually encountered north of SR 120 (as shown in the 2005 photo). In 2010, congestion did not typically make it back to this interchange.

PROJECT IMPROVEMENT: Southbound I-85 in Gwinnett County, Morning

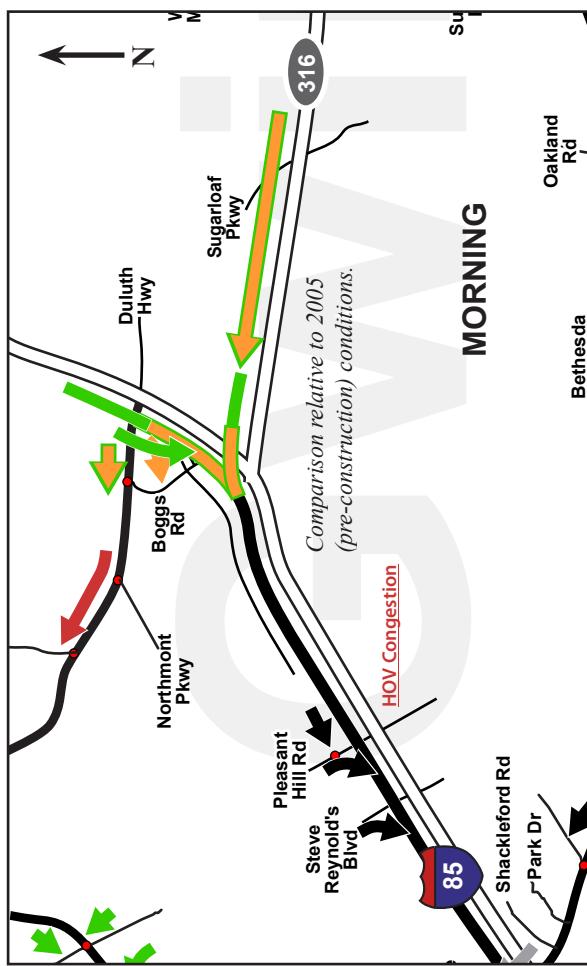
A Long-term construction project to rehabilitate and widen I-85 through the interchanges at SR 316 and Pleasant Hill Road had been completed prior to the 2010 survey flights. Previously, the two lanes of high-density traffic from SR 316 were required to merge into five lanes of I-85 traffic (prior to the relief of the exit ramp to Pleasant Hill Road and the start of the concurrent-flow HOV lane). SR 316 traffic bound for Pleasant Hill Road was required to merge to the left of I-85 flow and then weave right across four lanes to the exit ramp. At the same time, HOV-destined traffic entering I-85 upstream at Boggs Road was required to weave left across four lanes. These factors combined to generate extensive and severe daily congestion upstream of the merge along both of these major approaches.

Now, the new interchange by design separates HOV, local and “through” traffic into six distinct lane sets before reaching the merge – three on I-85 and three on SR 316 (the latter now has three flyover ramps built for this purpose). The need for sharp weaves has been greatly reduced because traffic streams from SR 316 are “flown over” and joined so homogeneous traffic streams can merge without interference from the other streams. Furthermore, this arrangement means that vehicles from SR 316 destined for the I-85 HOV lane or the exit ramp to Pleasant Hill Road are never required to merge into the general-purpose lanes of I-85: by the time the extra lanes are dropped farther south, Pleasant Hill Road traffic has already exited. (See also photo on page 19.)

Another benefit is that longer merge zones and the elimination of major weaving movements not only improve flow but also reduce the likelihood of minor vehicle accidents. So, even though the number of travel lanes has not increased south of Pleasant Hill Road, daily conditions have nevertheless improved significantly.

Delay estimates through the congested merge zone: Based on the density of traffic flow, an average speed of 20 mph is estimated for the two-mile distance from the SR 316 merge to Pleasant Hill Road. That correlates to six minutes of travel time, compared to about two minutes if uncongested; therefore the delay for the typical daily user through the merge is about four minutes. While other delays were sometimes found upstream of the merge, when present the tails were significantly shorter: on I-85 the tail was typically encountered after passing the Duluth Highway interchange, compared to before that point in the years prior to construction of the project. Likewise for SR 316, the tail of the ramp queue was much shorter for vehicles approaching from the east.

Decreased duration of congestion: When surveyed in 2005 before the start of construction, this part of I-85 was severely congested for all three hours of the morning survey period (6:30 to 9:30 a.m.). After completion of the project, during the 2010 survey period most congestion typically cleared each morning by around 8:30 a.m., making it just a two-hour zone of congestion.





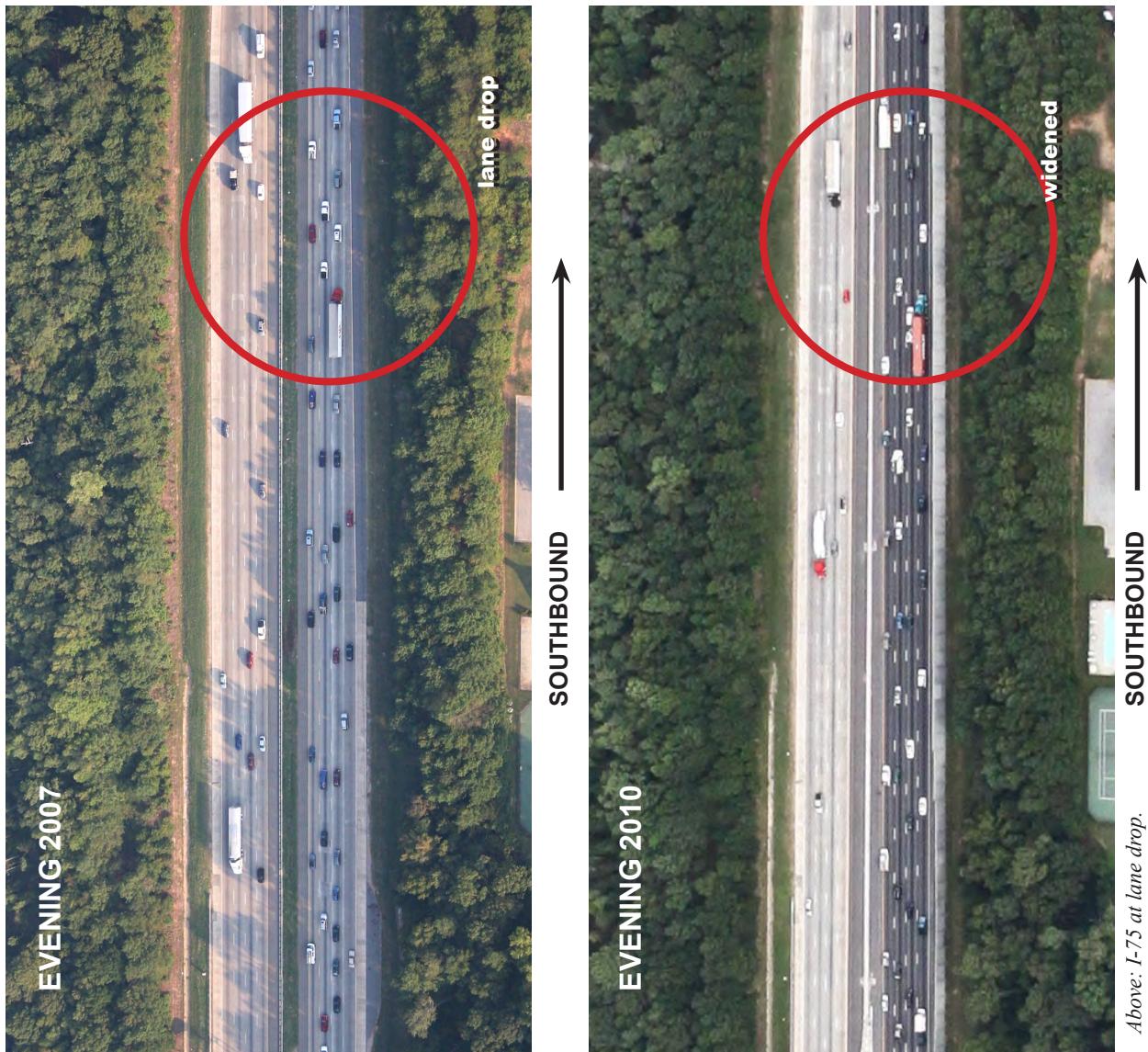
SOUTHBOUND

Above and left: I-75 at I-675 merge.

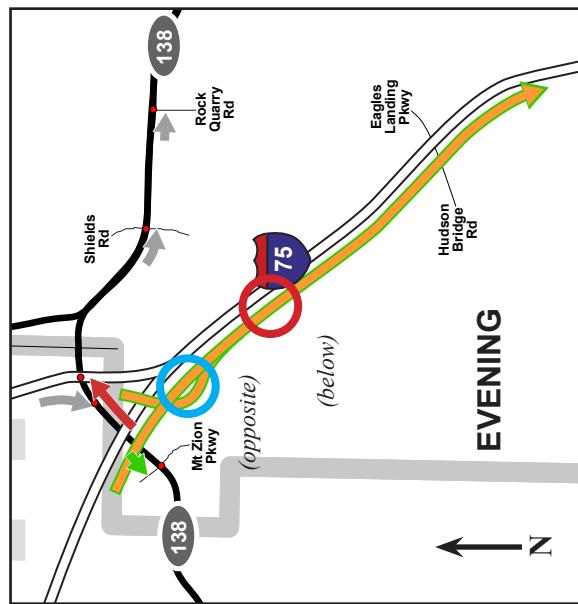


SOUTHBOUND

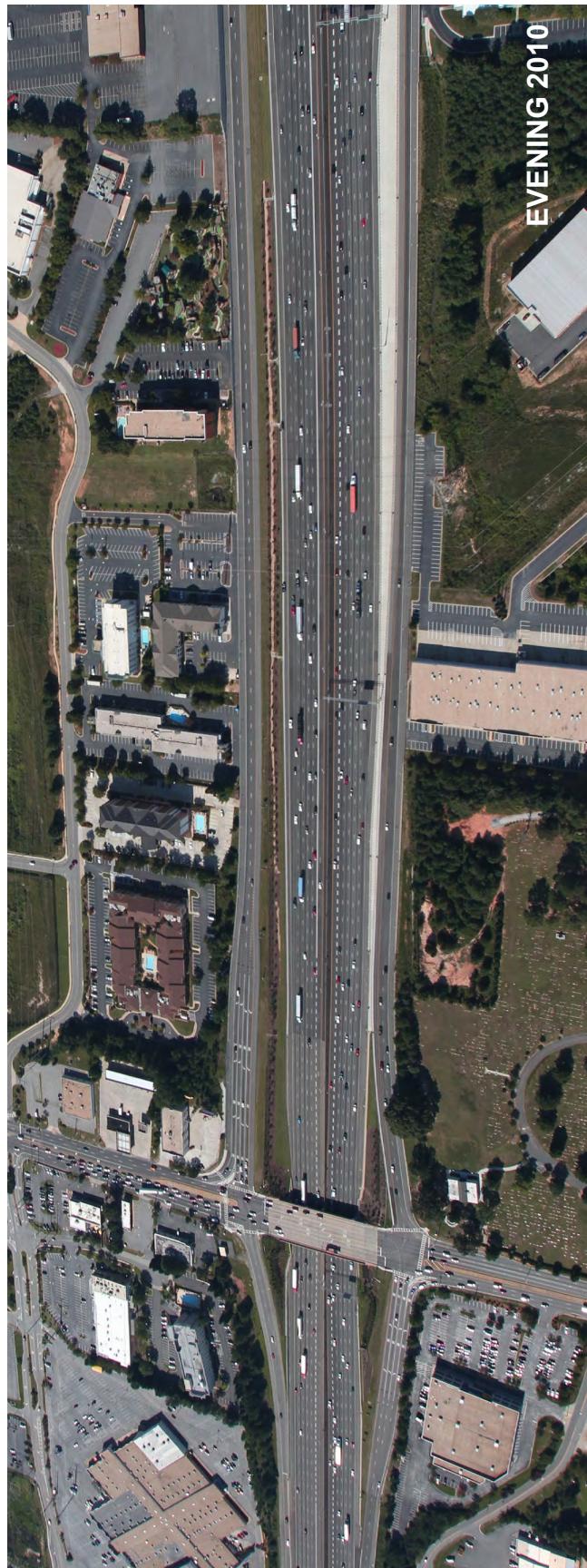
PROJECT IMPROVEMENT (Project ID: 0007858): I-75 in Henry County, Evening



Above: I-75 at lane drop.



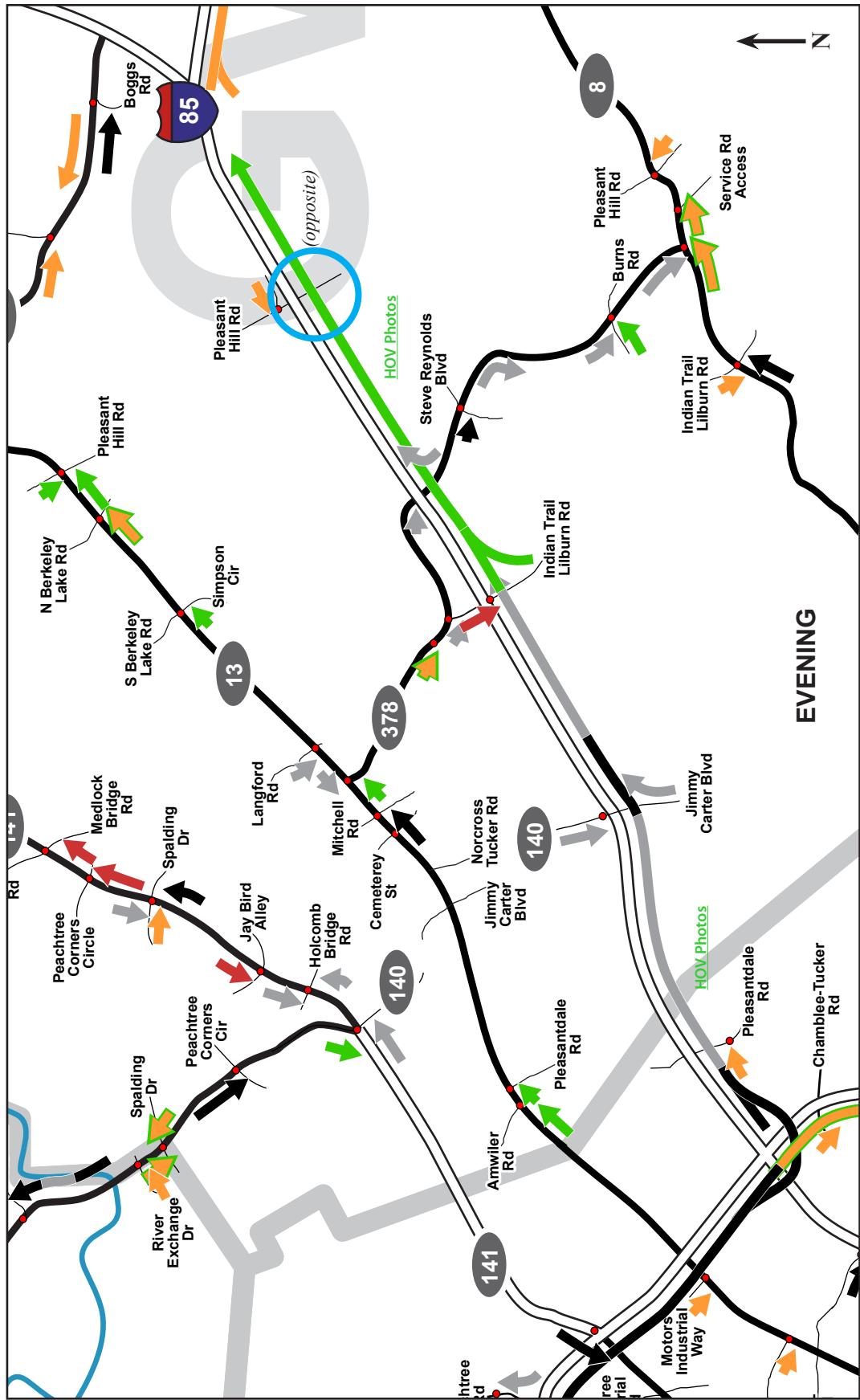
During the 2005 and 2007 surveys, southbound congestion on I-75 in the vicinity of the I-675 merge ranked among the top 10 congested corridors in the region. Between the 2007 and 2010 survey flights, an auxiliary lane was added between I-675 and Eagles Landing Parkway which appeared to contribute to improved conditions at the merge; however, downstream congestion appeared to be more severe between Eagles Landing Parkway and Jodeco Rd.



Above: I-85 at Pleasant Hill Rd.

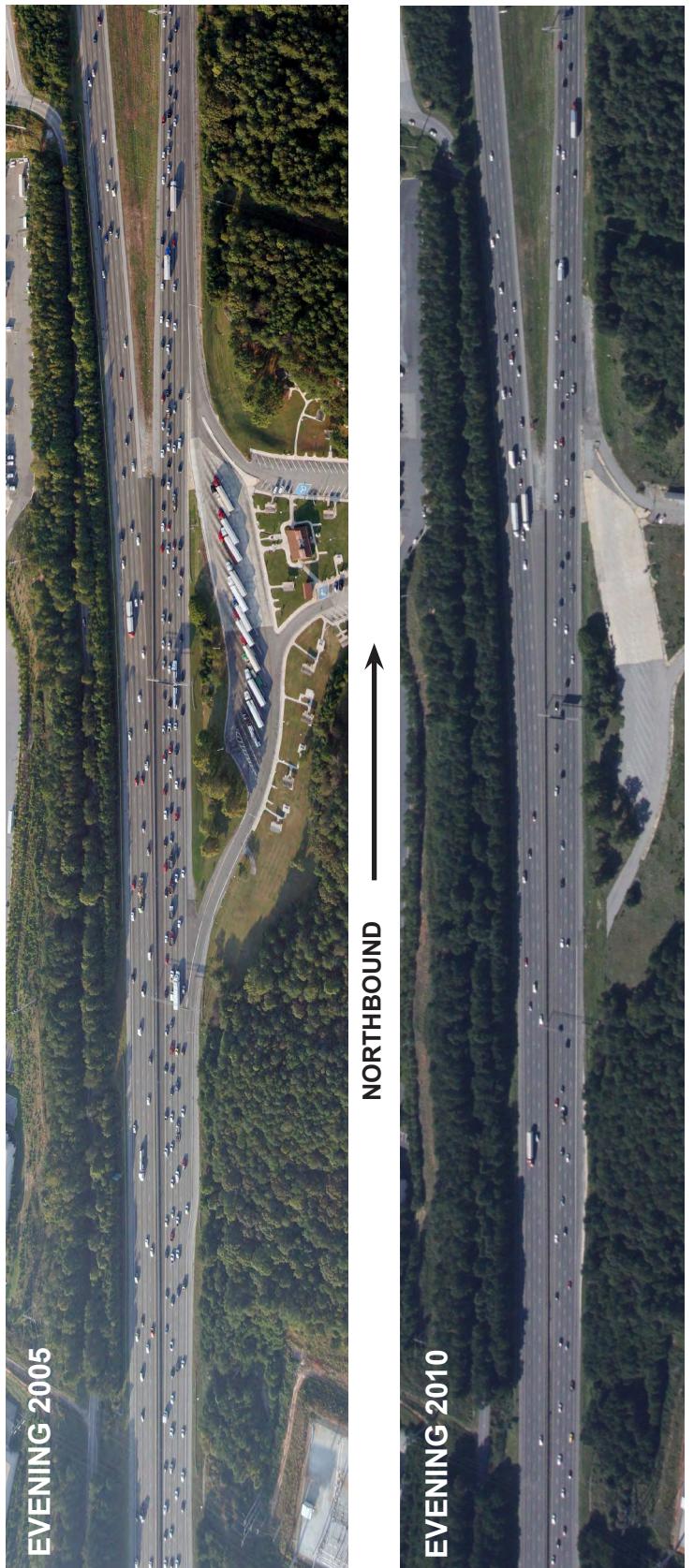
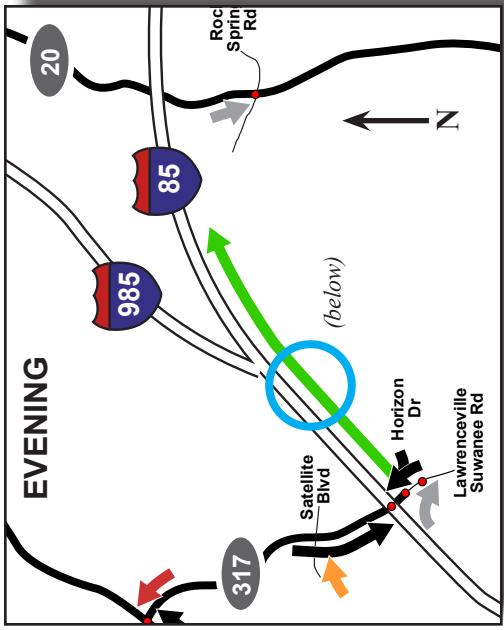
PROJECT IMPROVEMENT: I-85 in Gwinnett County, Evening

During the 2005 freeway survey flights, northbound congestion was typically found on I-85 between I-285 and SR 316. When surveyed in 2007, construction along this corridor was underway. Construction was completed by the 2010 survey that included: 1) the extension of the HOV facility; 2) a new frontage road between Pleasant Hill Rd and SR 120; and 3) the new SR 316 interchange. As a result, congestion was no longer found north of Indian Trail Lilburn Rd. The corridor overall has dropped out of the top 5 highest delay corridors and into the top 10, with delays typically less than 5 minutes.



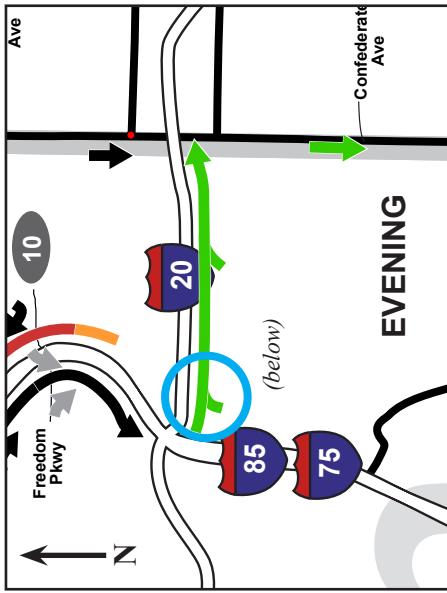
PROJECT IMPROVEMENT (Project ID: 0008234): I-85 in Gwinnett County, Evening

During the 2005 freeway survey flights, northbound congestion was found on I-85 approaching the lane drop (3 lanes to 2) in the vicinity of I-985. When surveyed in 2007, ongoing construction was underway to extend the third lane north to the SR 20 interchange. By the 2010 survey, construction was complete; observed conditions show that vehicles typically traveled at free-flow speeds in the vicinity of I-985.



Above: I-85 approaching I-985

PROJECT IMPROVEMENT: I-20 in Fulton County, Evening



During the 2007 freeway survey flights, eastbound congestion was found on I-20 between I-75/I-85 and SR 42; congestion appeared to be caused or exacerbated by traffic entering at the interchanges along this corridor. Average estimated speeds through the congested zone typically ranged from 40 to 50 mph. This zone ranked as one of the top 20 congested corridors in 2007, and was featured as a location with degraded conditions.

When observed in 2010, vehicles typically traveled at or above free-flow speeds along this corridor. Between the 2007 and 2010, ramp meters were installed to the entrance ramps at Capitol Ave, Hill St and SR 42. However, significant queuing was not found at the ramp meters; this suggests that other factors may have contributed to the improved conditions.

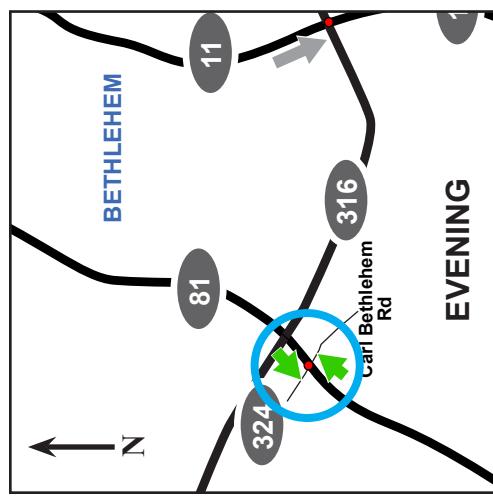


Above: I-20 at Main St. and Boulevard

PROJECT IMPROVEMENT: SR 81 at SR 324 (Carl Bethlehem Rd) in Barrow County, Morning and Evening



These photos show improvement in traffic flow at the SR 81 / SR 324 intersection completed between the 2008 and 2010 surveys; added capacity appears to have eliminated both northbound and southbound congestion during the morning and evening commuter periods.



Evening Photos: SR 81 northbound approach to SR 324.

PROJECT IMPROVEMENT (Project ID: 621255): SR 113 between SR 61 (Dallas Hwy) and Plymouth Dr in Bartow County, Morning & Evening

2004



2010

SOUTHBOUND



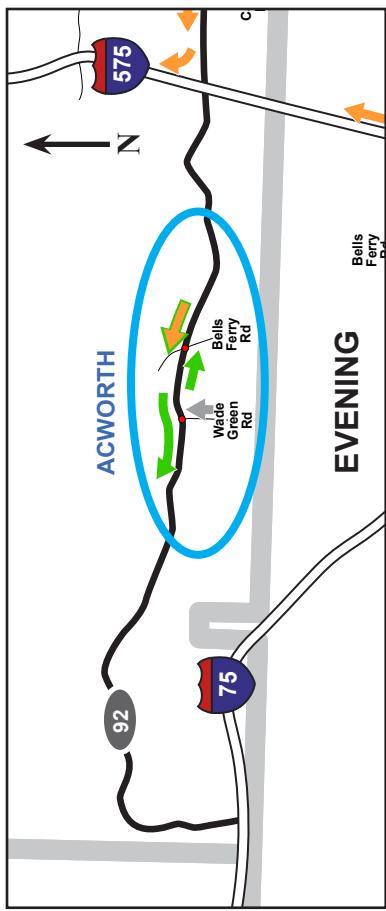
SOUTHBOUND

During the survey in 2008, SR 113 was under construction between SR 61 (Dallas Hwy) and Henderson Rd; this 2.5 mile segment was being widened from two to four lanes. Congestion was found in both directions along this section of SR 113 during the previous survey in 2004, and while under construction in 2007; the primary bottlenecks were found at Burnt Hickory Rd and Euharlee Rd. After widening was completed, photography taken during the 2010 survey documented the absence of congestion along this corridor.

Above: SR 113 southbound approach to Burnt Hickory Rd.

PROJECT IMPROVEMENT (Project ID: 620920, 620940): SR 92 between I-75 and I-575 in Cherokee County, Morning & Evening

During the survey in 2007, SR 92 was under construction between I-75 and I-575; this eight-mile segment was being widened from two to four lanes. During the previous survey in 2004, severe congestion was found along this corridor during the morning and evening commuter periods, with the primary bottlenecks found at Wade Green Rd and Bells Ferry Rd; similar congestion was found while under construction in 2007. The absence of congestion during the 2010 survey indicates that widening appears to have virtually eliminated congestion along this corridor.



2004



2010



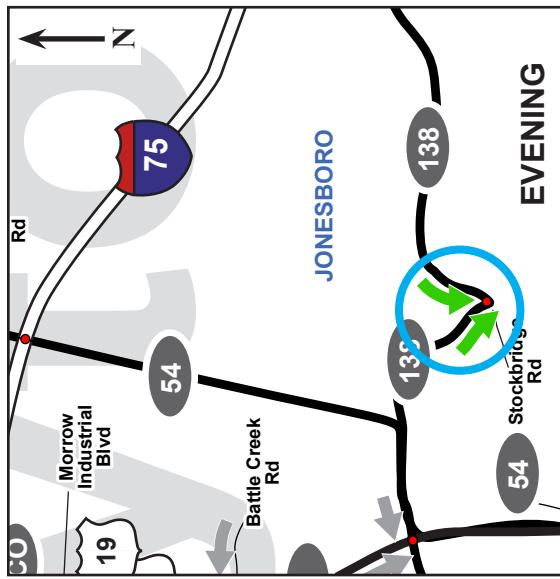
Above: SR 92 eastbound approach to Bells Ferry Rd

EASTBOUND

PROJECT IMPROVEMENT (Project ID: 721480): SR 138 at Stockbridge Rd in Clayton County, Evening



Part Two / Comparison, Section 2.1: Sites with improved mobility



During the survey in 2008, the intersection at SR 138 and Stockbridge Rd was under construction; capacity was being added on each of the four approaches. During the previous survey in 2004, eastbound congestion was found on SR 138 approaching the signal Stockbridge Rd; the queue appeared to be caused by vehicles in the left-turn bay extending back into the mainline. The absence of congestion during the 2010 survey suggests that added capacity, which included an additional left-turn lane on the eastbound approach, has eliminated the congestion.

Evening Photos: SR 138 eastbound approach at Stockbridge Rd

PROJECT IMPROVEMENT (Project ID: 721550): SR 85 at Garden Walk Blvd in Clayton County, Morning

2004



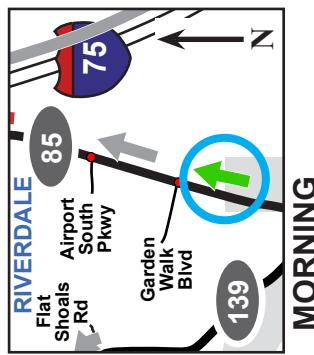
2008
NORTHBOUND



2010
NORTHBOUND



Above: SR 85 northbound approach to Garden Walk Blvd



MORNING

Northbound congestion on SR 85 at Garden Walk Blvd documented during the morning surveys in 2004 and 2007 was not found in 2010. Reconfiguration of the intersection and retiming (presumably) of the signal likely contributed to the absence of congestion. An additional left-turn lane (2 lanes vs. 1) was added on SR 85 on the northbound approach to the signal; capacity was also increased on the eastbound approach on Garden Walk Parkway.

PROJECT IMPROVEMENT: SR 8 at I-285 in Dekalb County, Morning & Evening

During the 2004 survey, morning and evening recurring congestion was found on SR 8 in the vicinity of the I-285 Interchange; interchange reconstruction and the widening of SR 8 in the vicinity of I-285 appears to have eliminated the bottlenecks.

2004



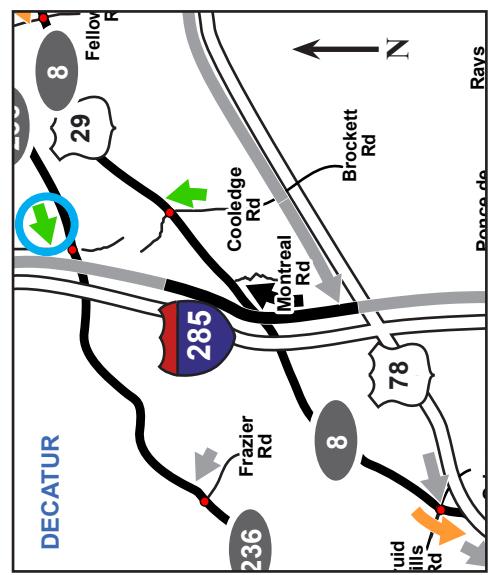
2010

WESTBOUND



WESTBOUND

Morning Photos: SR 8 at I-285.



PROJECT IMPROVEMENT: SR 279 at SR 138 in Fulton County, Morning

2004



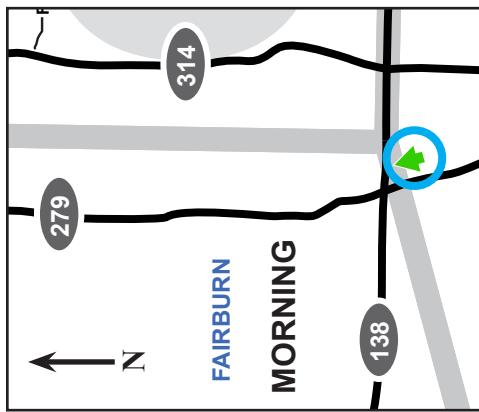
2008



2010

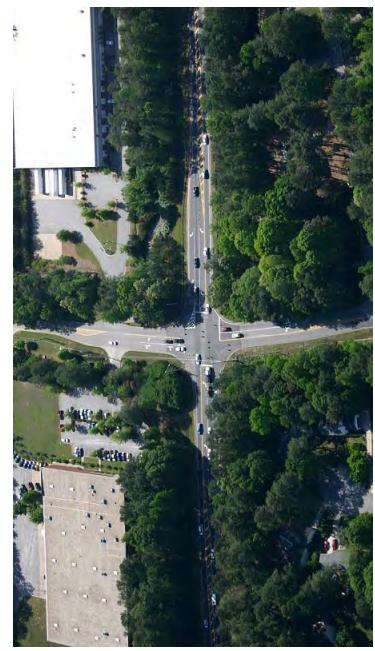


Morning Photos: SR 279 northbound approach to SR 138.



During the morning surveys in 2004 and 2008, northbound congestion was found on SR 279 approaching the signal at SR 138 (under construction during the 2008 survey); added capacity on the northbound approaches appear to have eliminated the congestion documented during the earlier surveys.

2004



NORTHBOUND

PROJECT IMPROVEMENT (Project ID: 322355): SR 74 in Fayette County, Morning & Evening

Prior to the 2010 survey, SR 74 was widened from a two-lane highway to a four and six-lane highway for a length of four miles, between Cooper Circle and SR 54 to the north; this section of SR 74 was under construction during the survey in 2008. Increased capacity appears to have eliminated the bottlenecks that were found during the earlier survey in 2004, and again in 2008; these included the signalized intersections at Redwine Rd and Kelly Dr. Additional widening was ongoing during the 2010 survey between Cooper Circle and SR 85 to the south.

2008



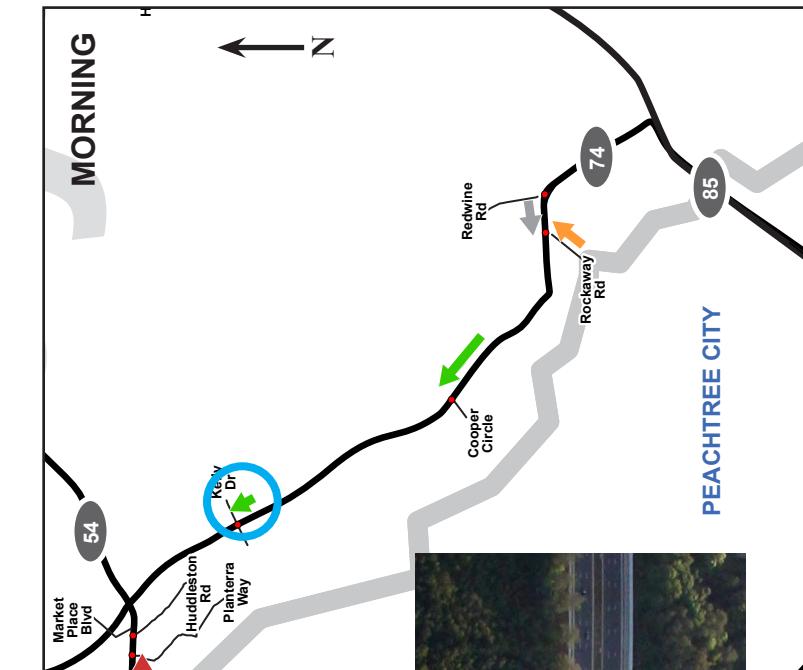
NORTHBOUND

2010



NORTHBOUND

NORTHBOUND



Morning Photos: SR 74 at Kelly Dr.

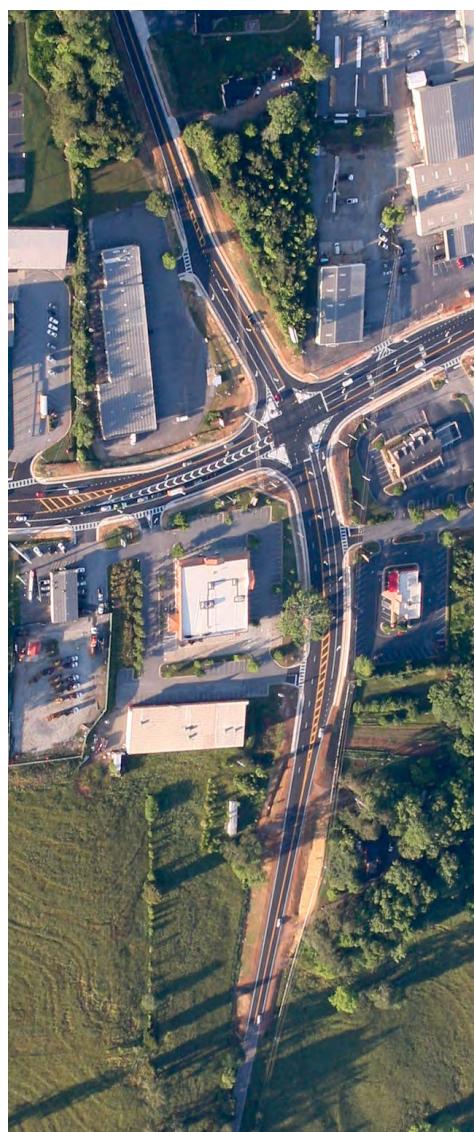
PROJECT IMPROVEMENT (Project ID: 0000810): SR 371 at SR 9 in Forsyth County, Morning and Evening

These photos show intersection improvements at the SR 371 / SR 9 intersection completed between the 2008 and 2010 surveys; increased capacity appears to have eliminated congestion previously found during the 2008 morning and evening surveys.

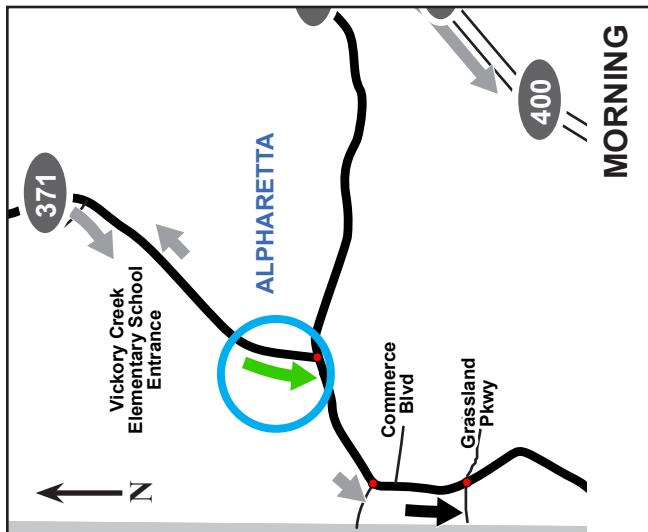
2008



2010



Morning Photos: SR 371 southbound approach to SR 9.



PROJECT IMPROVEMENT (Project ID: 0000810): SR 9 at Castleberry Rd in Forsyth County, Evening

During the evening survey period in 2008, eastbound congestion was found on SR 9 approaching the intersection at Castleberry Rd (no signal); vehicles waiting to turn left onto Castleberry Rd appeared to cause the congestion. Prior to the 2010 survey, intersection reconstruction was completed that included the addition of dedicated left and right turn lanes on all four approaches.

2008



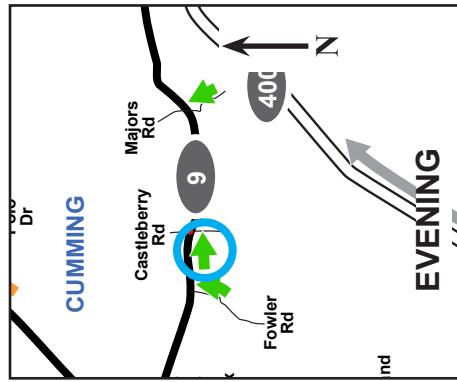
2010



Evening Photos: SR 9 eastbound approach to Castleberry Rd

EASTBOUND

EASTBOUND



PROJECT IMPROVEMENT (Project ID: 0000810): SR 9 at Majors Rd in Forsyth County, Evening

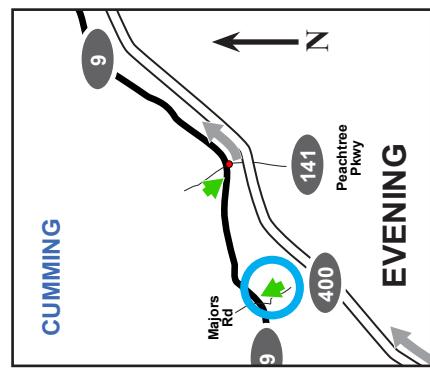
2008



2010



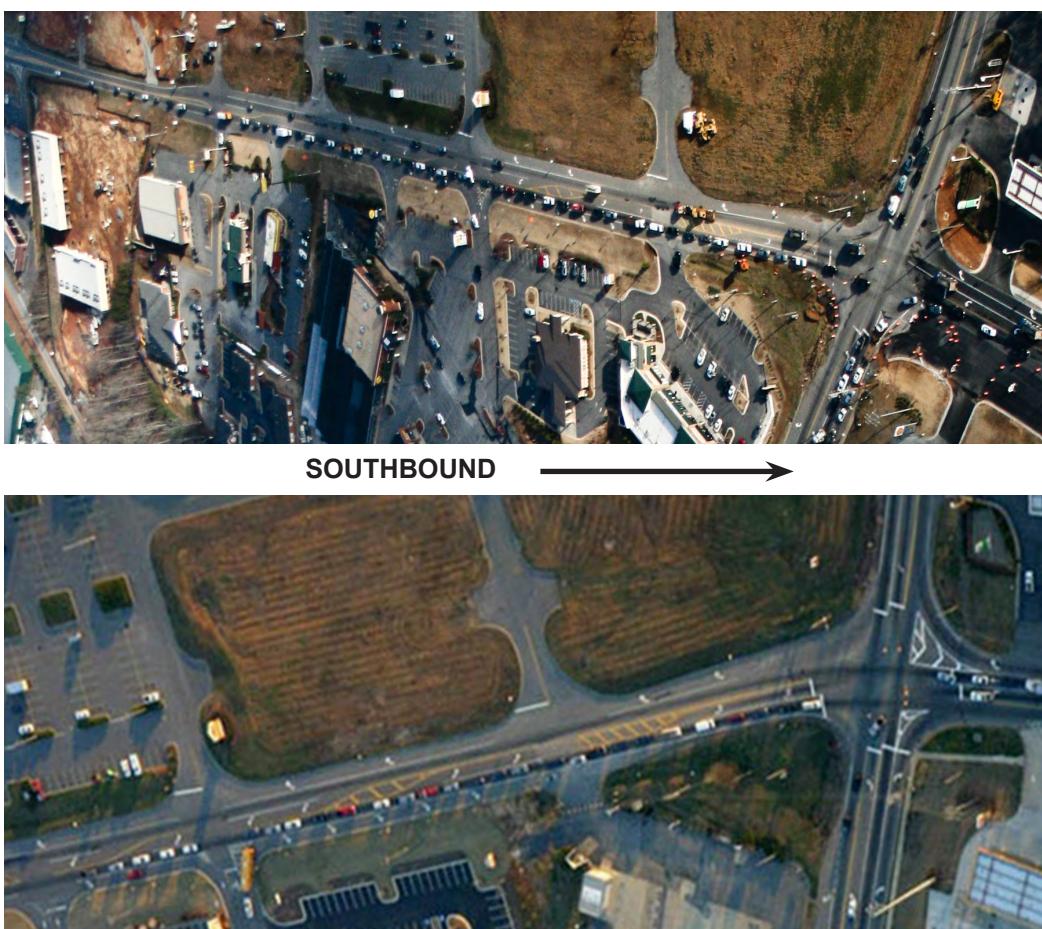
During the 2008 survey, northbound congestion was found on Majors Rd in the evening approaching the stop sign at SR 9; reconstruction of the intersection that included the installation of a signal, and increased capacity on all four approaches explain the absence of congestion in 2010.



Morning Photos: SR 9 at Majors Rd.

PROJECT IMPROVEMENT (Project ID: 0000810): SR 9 at SR 141 in Forsyth County, Morning & Evening

2004



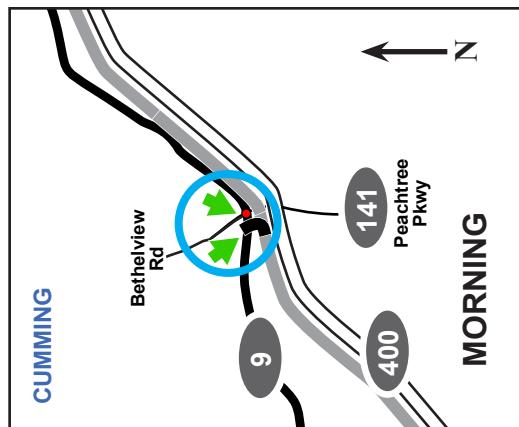
2008



2010



During the 2004 survey, congestion was found on several approaches to the SR 9 / SR 141 intersection; reconstruction of the intersection (ongoing during the 2008 survey) that included additional turn-lanes appears to have eliminated congestion here during the morning and evening commuter periods.



Morning Photos: SR 9 southbound approach to SR 141.

PROJECT IMPROVEMENT (Project ID: 721000): SR 120 at Parsons Rd in Fulton County, Morning

During the survey in 2007, the intersection at SR 120 and Parsons Rd was under construction; capacity was being added on three of the four approaches.

During the previous survey in 2004, and in 2007, westbound congestion was found here during the morning commuter period. Increased capacity appears to have accounted for the absence of congestion in 2010.

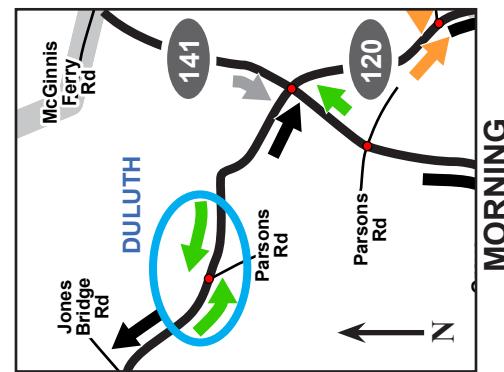
2004



2010

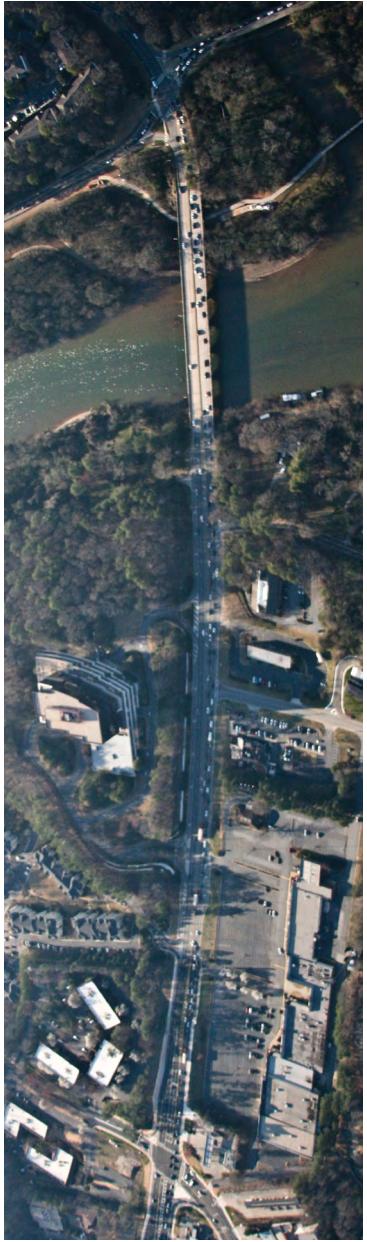


Morning Photos: SR 120 at Parsons Rd



PROJECT IMPROVEMENT (Project ID: 721010): SR 9 at Riverside Dr in Fulton County, Evening

2008

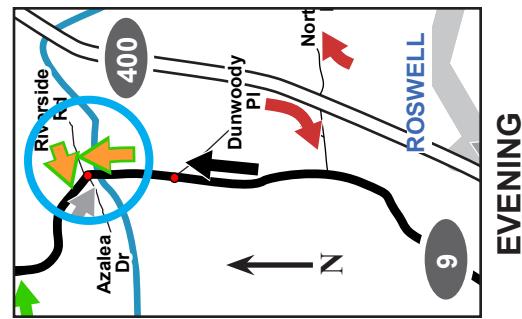


NORTHBOUND



2010

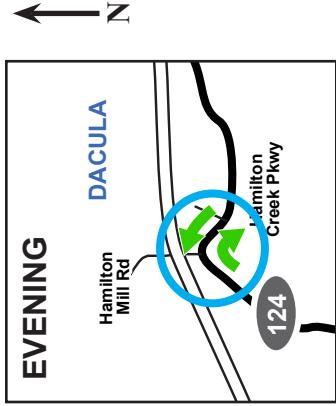
These photos show improvements at the SR 9 / Riverside Dr intersection completed between the 2008 and 2010 surveys; the addition of a dedicated left-turn lane at the signal appears to have lessened northbound congestion in the evening. Peak congestion found in 2008 sometimes extended all the way back through the upstream signal at Dunwoody Place. Intersection reconstruction may also have lessened westbound congestion on Riverside Dr.



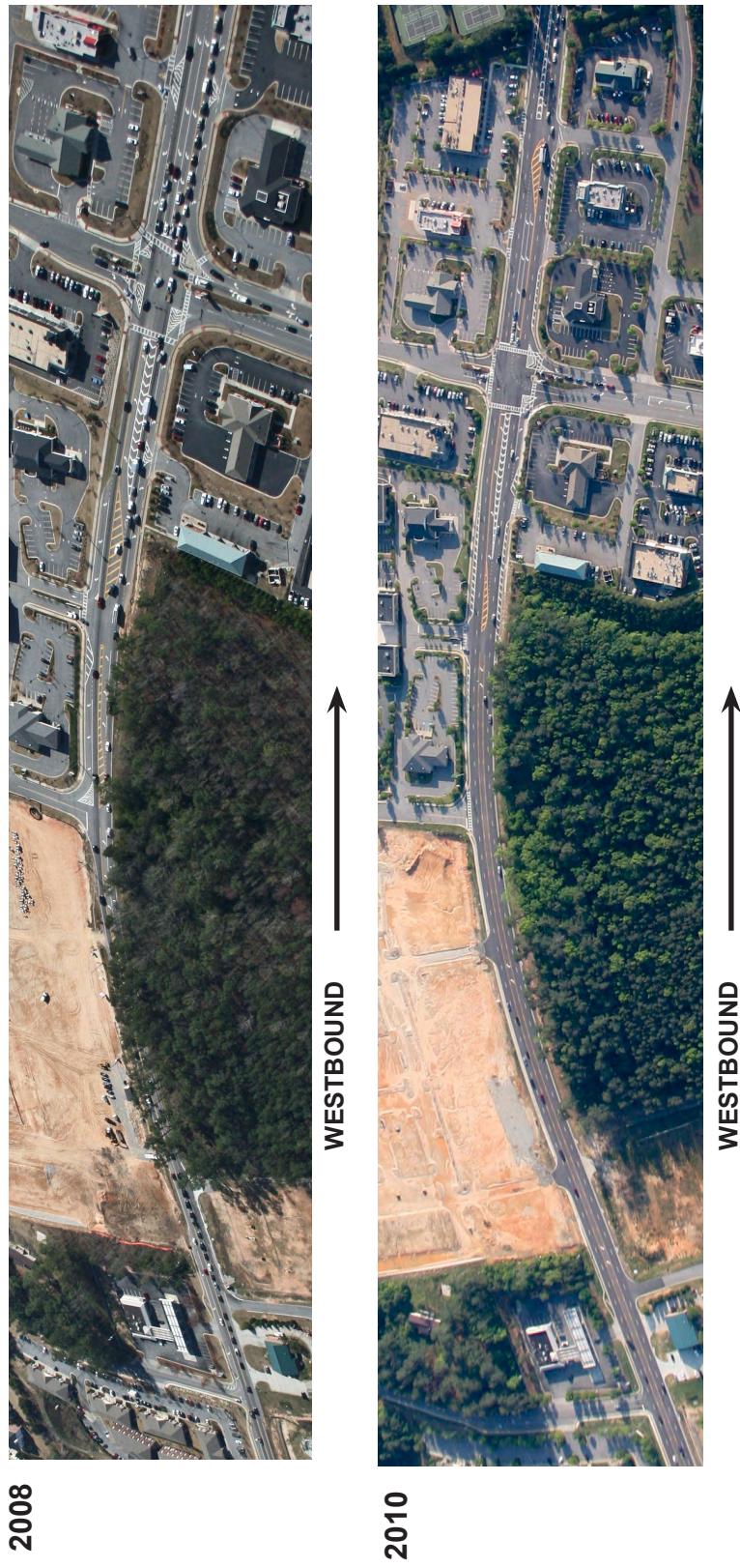
NORTHBOUND

Evening Photos: SR 9 northbound approach to Riverside Dr.

PROJECT IMPROVEMENT: SR 124 at Hamilton Mill Rd in Gwinnett County, Morning & Evening



Between the aerial surveys in 2008 and 2010, SR 124 was widened from two to four lanes between Hamilton Mill Rd and Pine Rd (a distance of one mile), during the survey in 2008, recurring eastbound and westbound congestion found at Hamilton Creek Pkwy. Increased capacity appears to have accounted for the absence of congestion in 2010.



Evening Photos: SR 124 westbound approach to Hamilton Creek Pkwy

PROJECT IMPROVEMENT (Project ID: 132890): SR 13 at Pleasant Hill Rd in Gwinnett County, Morning and Evening

2004



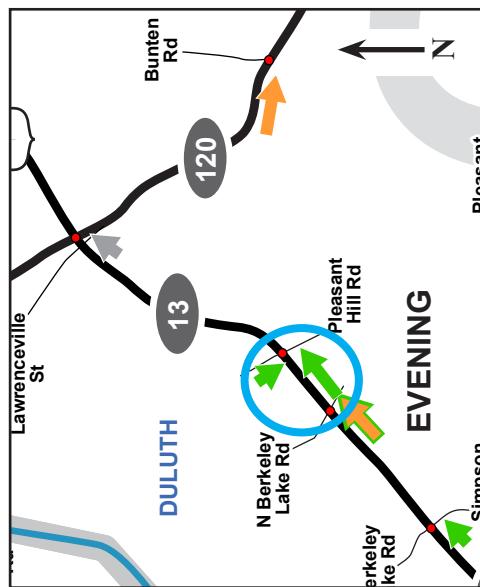
2010

NORTHBOUND



NORTHBOUND

Evening Photos: SR 13 northbound approach to Pleasant Hill Rd.

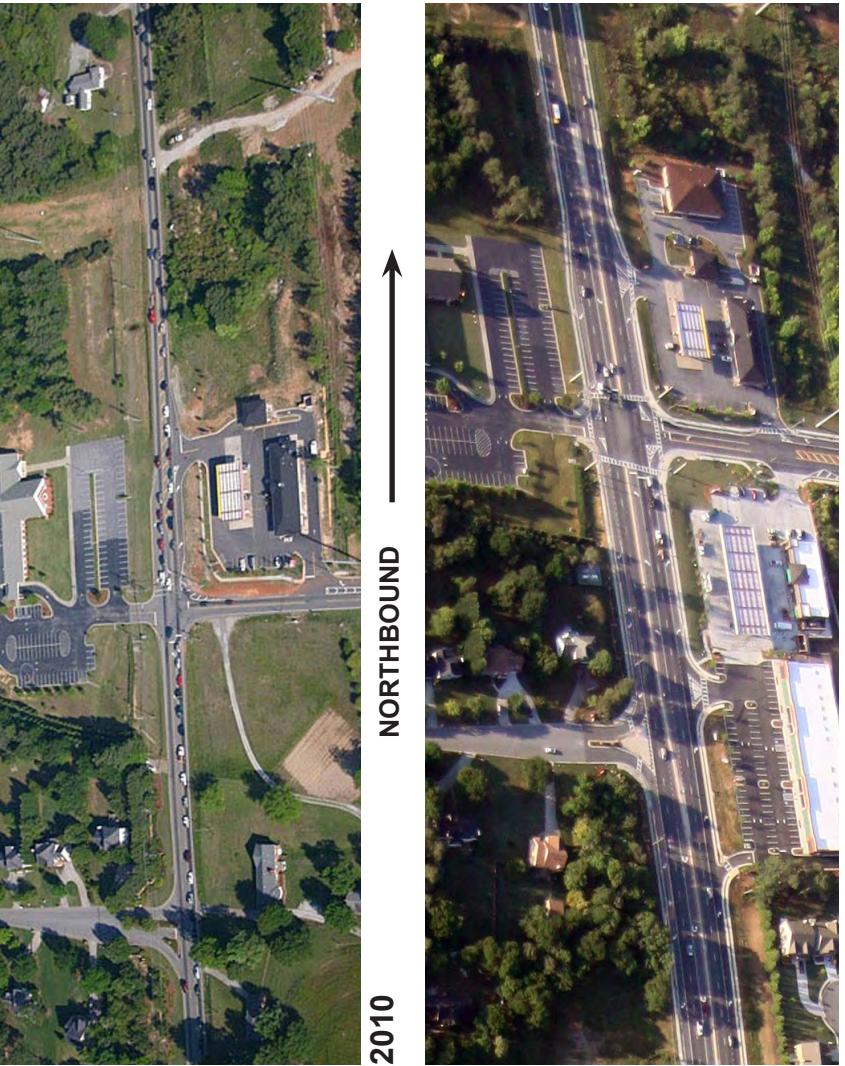


During the morning and evening surveys in 2004, severe congestion was found on all four approaches to the intersection at SR 13 and Pleasant Hill Rd; while surveyed in 2008, similar congestion was found here while a grade separated interchange was being constructed. The grade separated interchange, completed prior to the 2010 survey has eliminated congestion at this location.

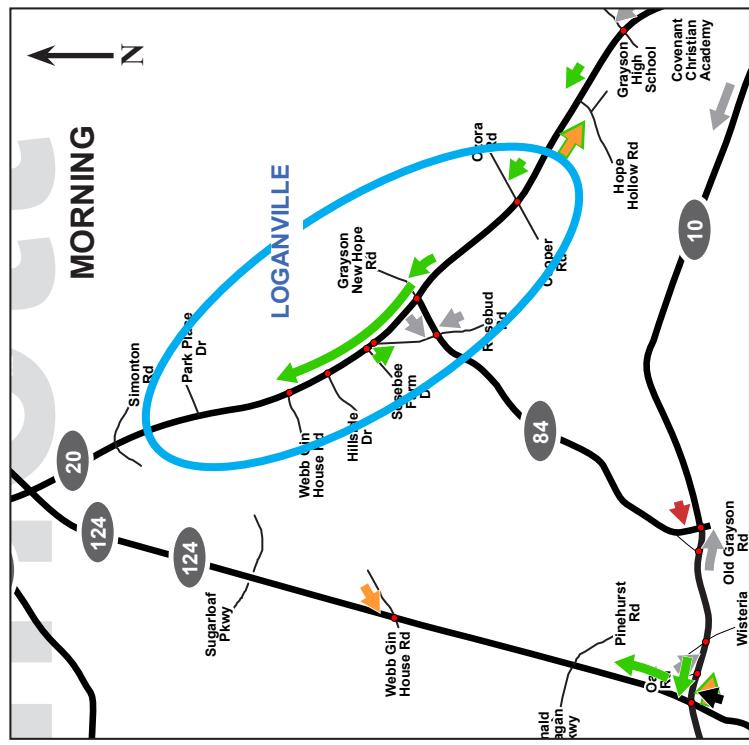
PROJECT IMPROVEMENT (Project ID: 121710): SR 20 in Gwinnett County, Morning and Evening

During the morning and evening surveys in 2004, severe congestion was found on SR 20 between Plantation Blvd and Hope Hollow Rd; congestion during the morning commuter period was found in the northbound direction while southbound congestion was found in the evening. A series of bottlenecks was found at the various signalized intersections along this five-mile section of SR 20. During the 2008 survey, similar congestion was found along this corridor while the roadway was being widened from two to four lanes. While surveyed in 2010, minor intermittent delays were found here, but for the most part it appeared that commuters experienced little or no delay.

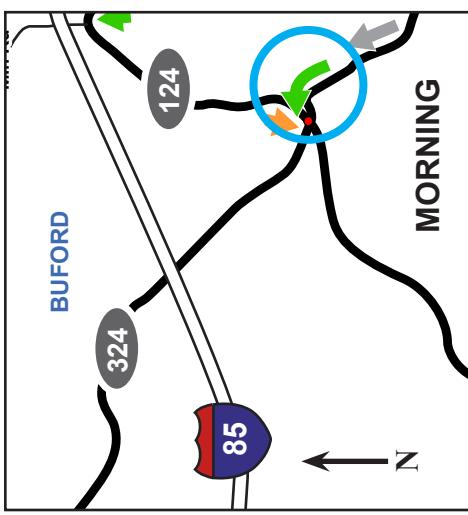
2004



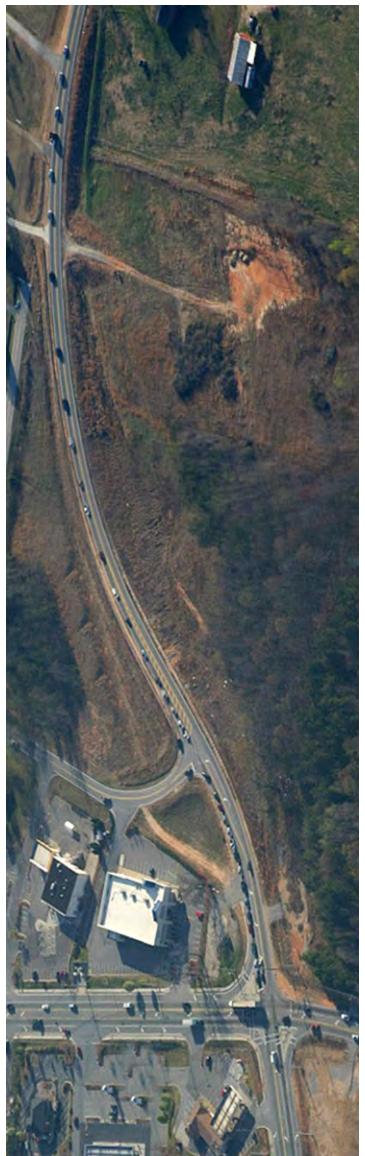
Morning Photos: SR 20 northbound approach to Web Gin House Rd.



PROJECT IMPROVEMENT: SR 324 in Gwinnett County, Morning and Evening



2004



WESTBOUND

Prior to the 2010 survey, SR 324 was widened to a four-lane highway for a length of four miles, between SR 124 and SR 20; this section of SR 324 was under construction during the survey in 2008. Intersection reconstruction at SR 124 appears to have eliminated westbound congestion found during the morning period in 2004 and 2008; two thru lanes are now available vs. one previously.

2010



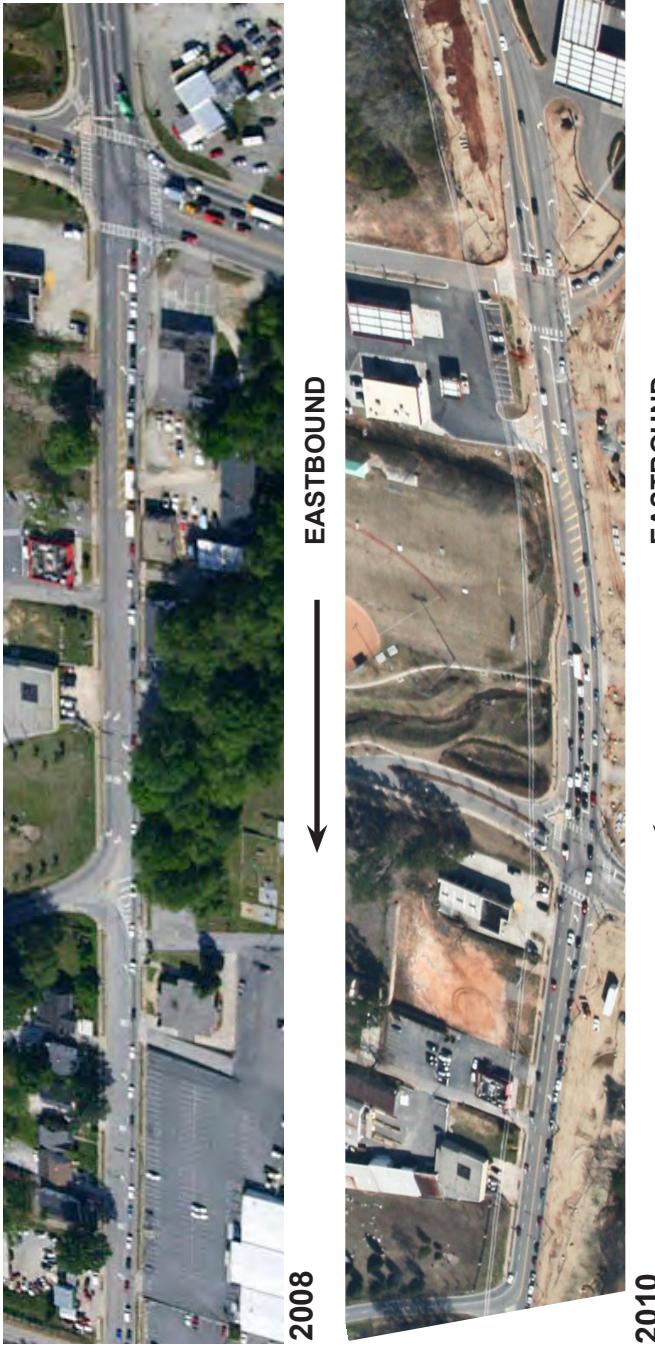
WESTBOUND

Morning Photos: SR 324 westbound approach to SR 124.

PROJECT IMPROVEMENT: SR 8 at SR 124 in Gwinnett County, Morning & Evening

During the 2004 survey, severe congestion was found on SR 8 at SR 124 (Scenic Hwy); morning congestion was found in the westbound direction, evening congestion in the eastbound direction. Similar congestion was found during the 2008 survey while SR 8 was under construction; widening of the roadway and intersection reconstruction at SR 124 and Paper Mill Rd appears to have eliminated congestion here during the morning and evening commuter periods.

2004



2010

EASTBOUND

EASTBOUND

EASTBOUND



Evening Photos: SR 8 eastbound approach to SR 124.

PROJECT IMPROVEMENT (Project ID: 162530): SR 124 at Sugarloaf Parkway in Gwinnett County, Evening

2008 → NORTHBBOUND



2010 ← NORTHBBOUND



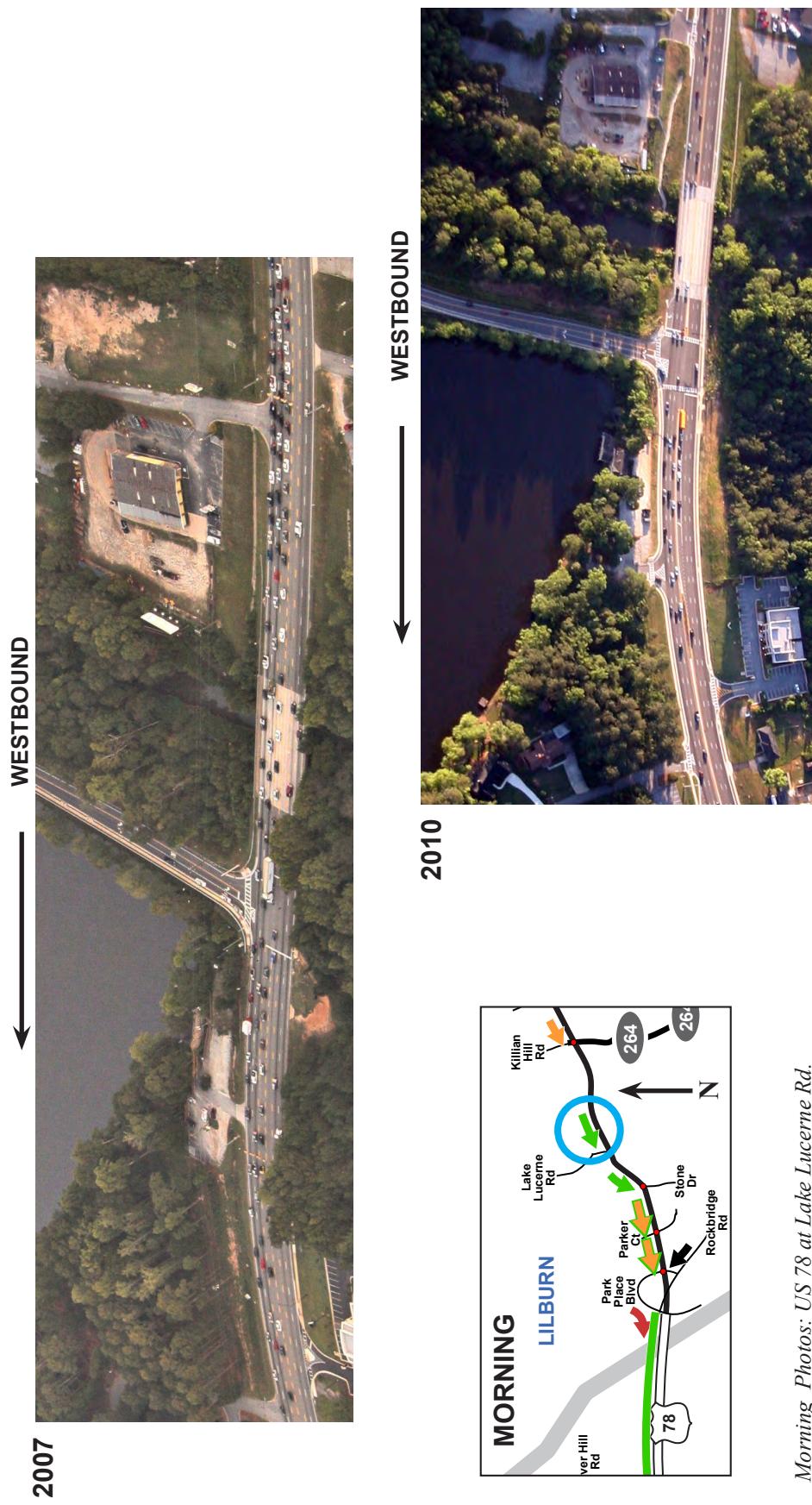
During the evening period in 2008, northbound congestion was typically found in the left-turn bay at Sugarloaf Parkway; intermittently, congestion in the left-turn bay extended back into the lane on SR 124 (see 2008 photo). Prior to the 2010 survey, an additional left-turn lane was added in the northbound direction (see 2010 photo) that appears to have eliminated congestion here.

The 2008 photo shows congestion in the left-turn bay (one lane) extending back into the mainline on SR 13. The 2010 photo shows the addition of a left-turn lane after intersection reconstruction.

PROJECT IMPROVEMENT (Project ID: 0003406): US 78 in Gwinnett County, Morning

A six-mile segment of US 78, between the termination of the freeway section at Park Place Blvd and SR 124 to the east, is comprised of six lanes; in 2007, the number of available lanes by direction changed during the morning and evening commuter periods. In the morning, three lanes were available in the peak direction (westbound), while two lanes were available eastbound. The sixth lane was utilized for left-turning vehicles. In the evening, three lanes were available in the peak direction (eastbound), while two lanes were available westbound.

Prior to the 2010 survey, the striping was changed such that three lanes were available in each direction at all times; in addition, dedicated left-turn lanes were added at most cross roads. Re-striping and added capacity (left-turn bays) appears to have eliminated congestion at several locations along this section of US 78 (see green arrows on graphic).



PROJECT IMPROVEMENT: SR 306 at Parks Rd in Hall County, Evening

During the 2008 survey, minor eastbound congestion was found on SR 306 in the vicinity of Parks Rd (approximately two miles east of SR 400); the intersection at SR 306 and Parks Rd was under construction at the time. Congestion was not found here in 2010 after completion of the intersection reconstruction that included the installation of a signal.

2008



2010



EASTBOUND

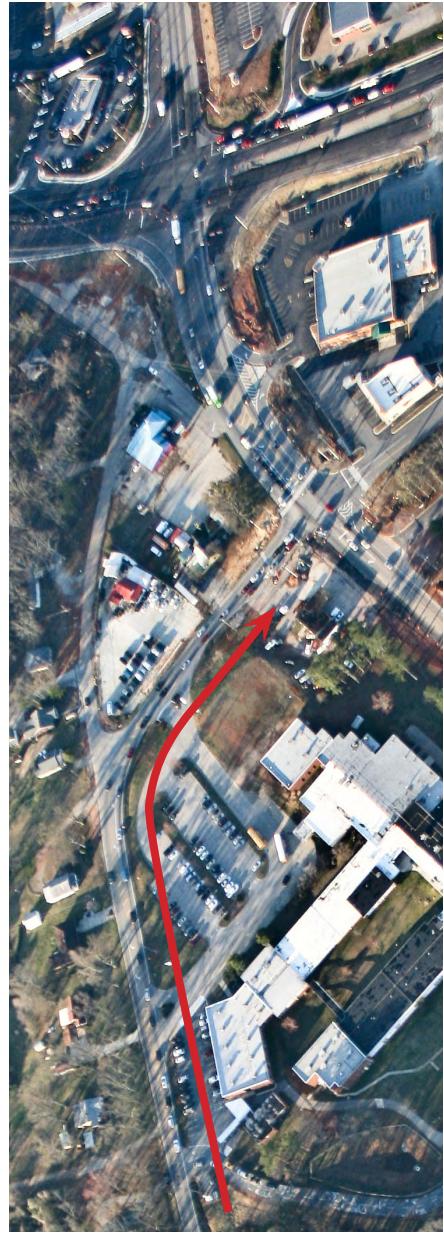
EASTBOUND

Evening Photos: SR 306 at Parks Rd.

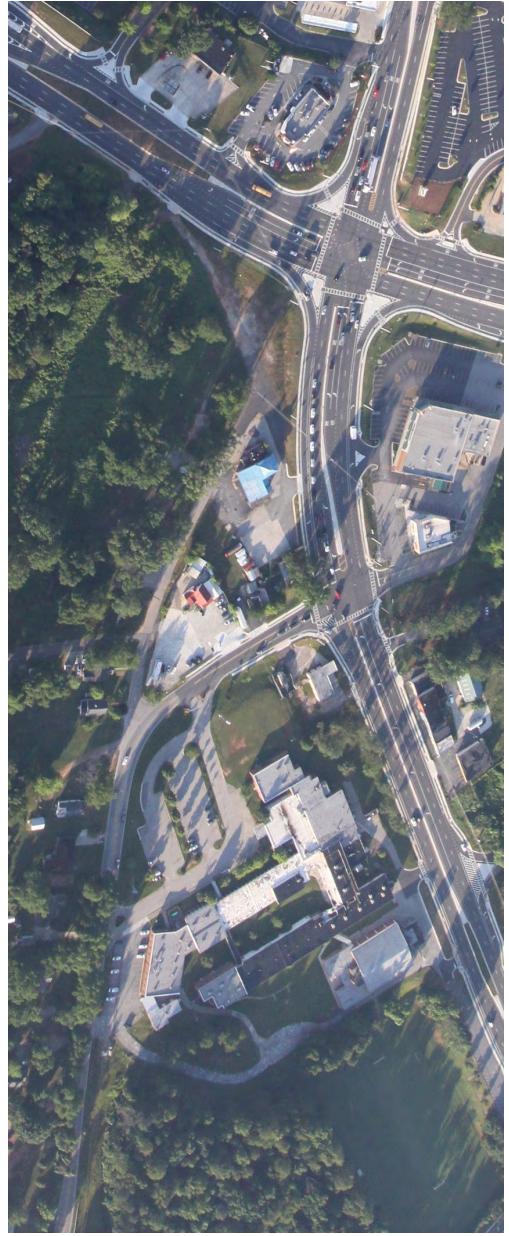


PROJECT IMPROVEMENT: SR 332 at SR 13 in Hall County, Morning

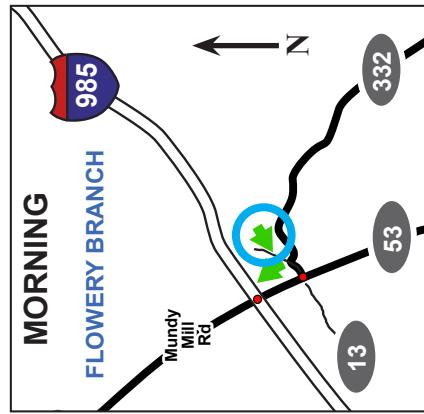
2008



2010

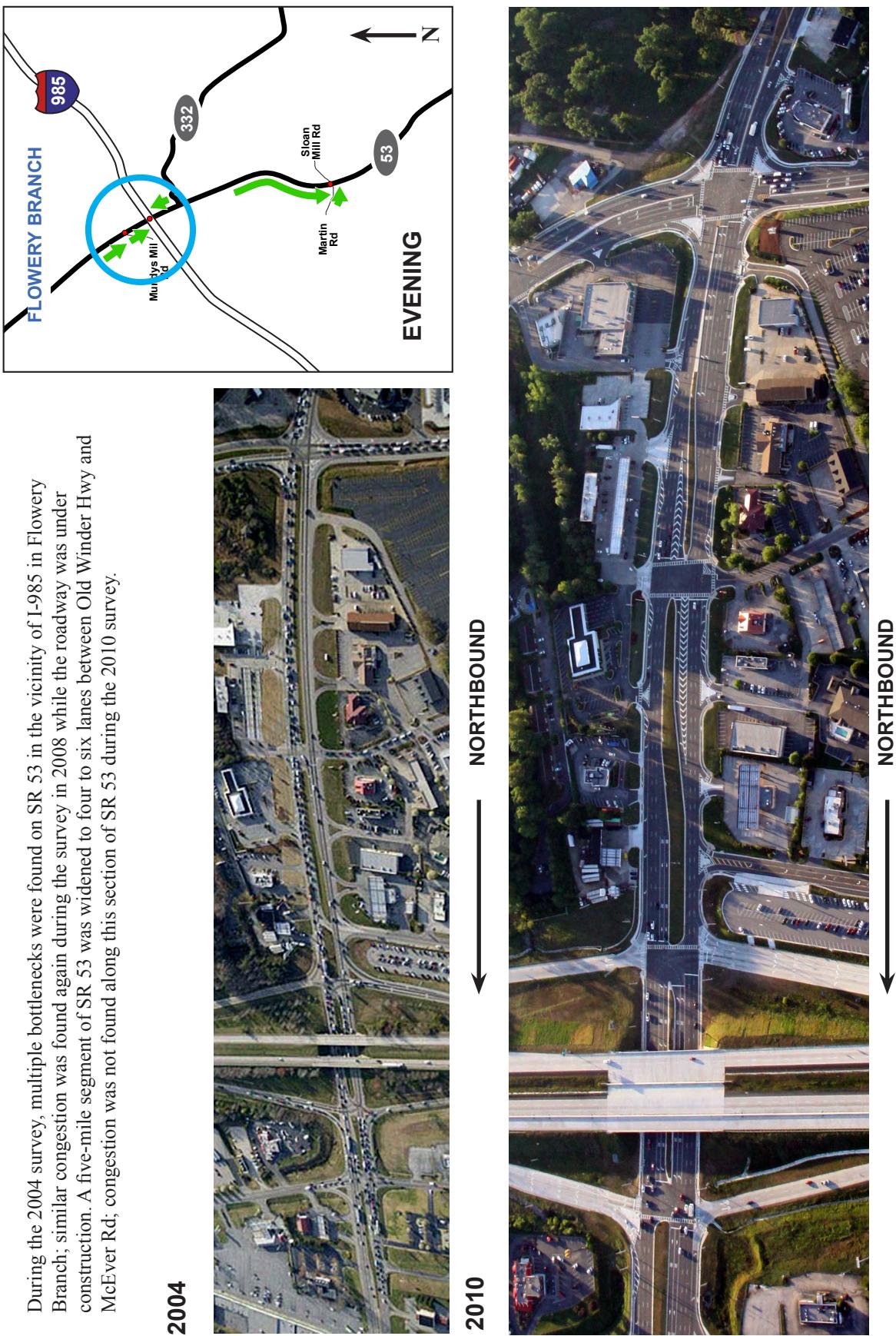


During the morning peak period in 2008, westbound congestion was found on SR 332 approaching the signal at SR 13 (see top left of 2008 photo). The intersection was under construction during the 2008 survey; however all lanes were open on each of the approaches. Construction here was likely related to the widening project on SR 53 located just to the west (see right edge of 2008 and 2010 photos). Delays were not found on SR 332 during 2010 survey.



Morning Photos: The top left of the 2008 photo shows westbound congestion on SR 332 approaching the signal at SR 13; construction on SR 53 is visible along the right edge of the photo. The 2010 photo shows intersection improvements at SR 332/SR 13 and SR 13/SR 53.

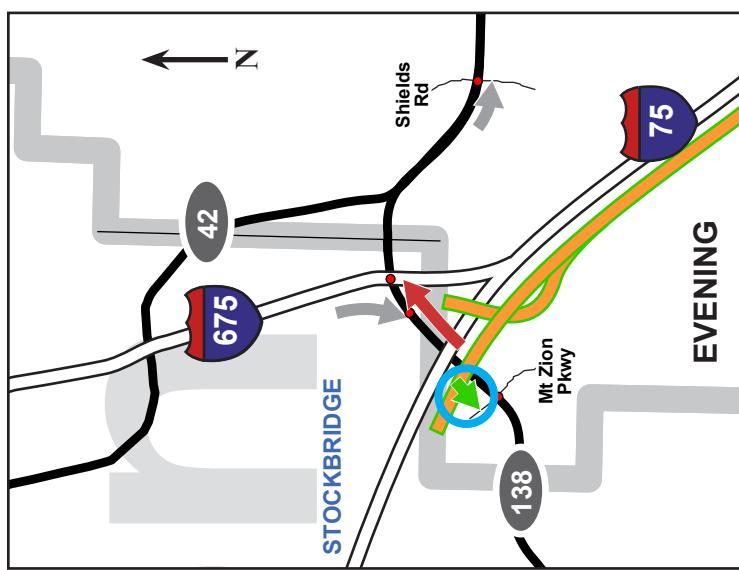
PROJECT IMPROVEMENT (Project ID: 122020): SR 53 in Hall County, Morning and Evening



PROJECT IMPROVEMENT (Project ID: 721480): SR 138 at Mt. Zion Rd in Henry County, Morning & Evening



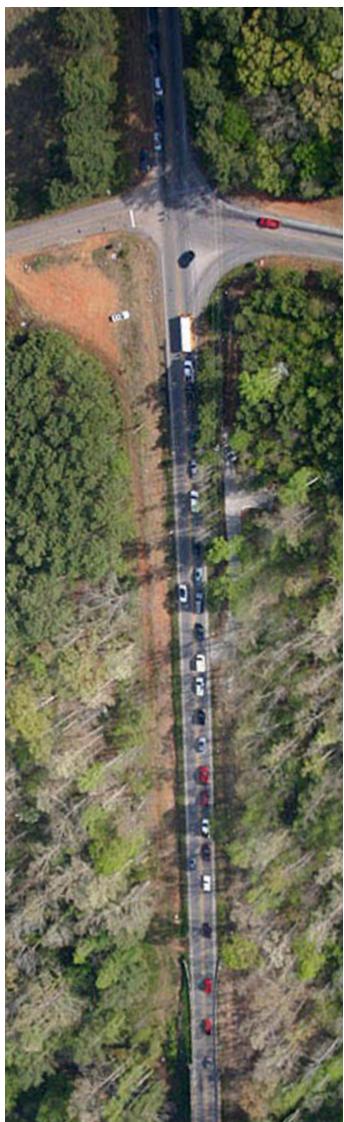
Evening Photos: SR 138 at Mt. Zion Rd



During both the 2004 and 2008 surveys, eastbound and westbound congestion was found on SR 138 approaching the intersection at Mt. Zion Rd (the intersection was under construction during the 2008 survey). Added capacity between 2004 and 2008 on all four approaches appears to have eliminated congestion during the morning and evening commuter periods.

PROJECT IMPROVEMENT (Project ID: 3333295): SR 155 at Millers Mill Rd in Henry County, Morning and Evening

2004



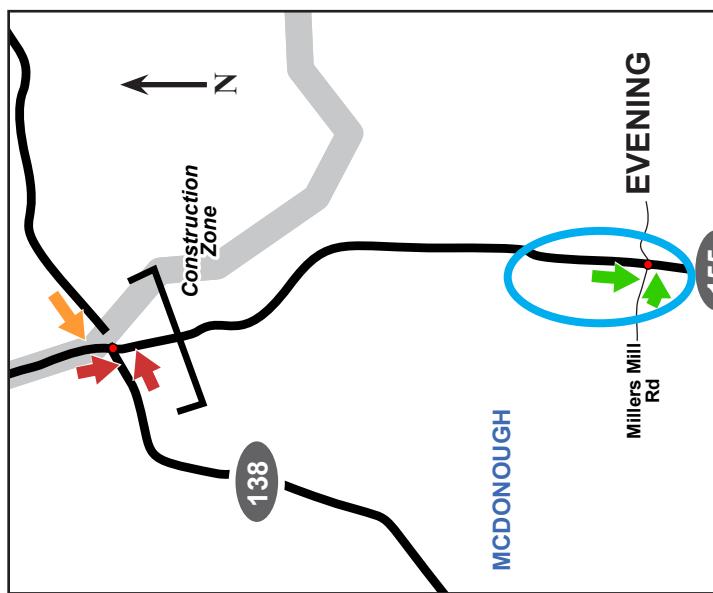
2008

SOUTHBOUND



2010

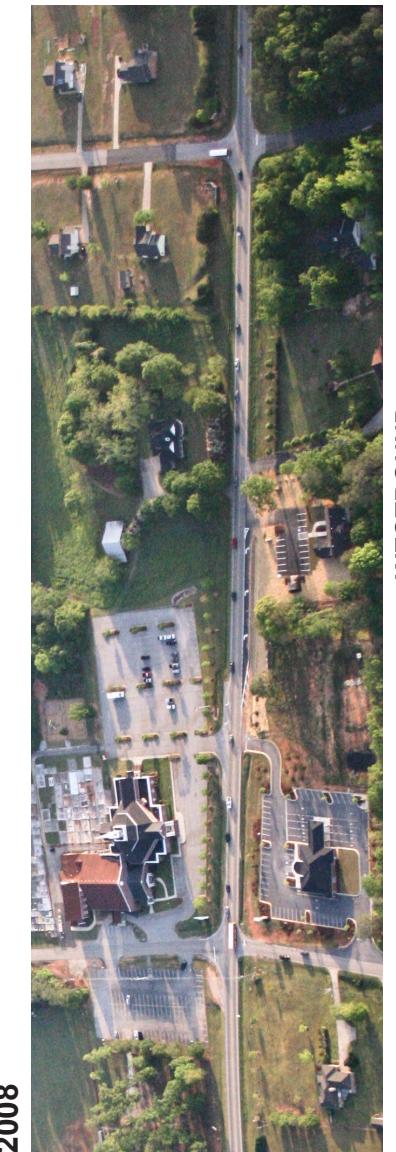
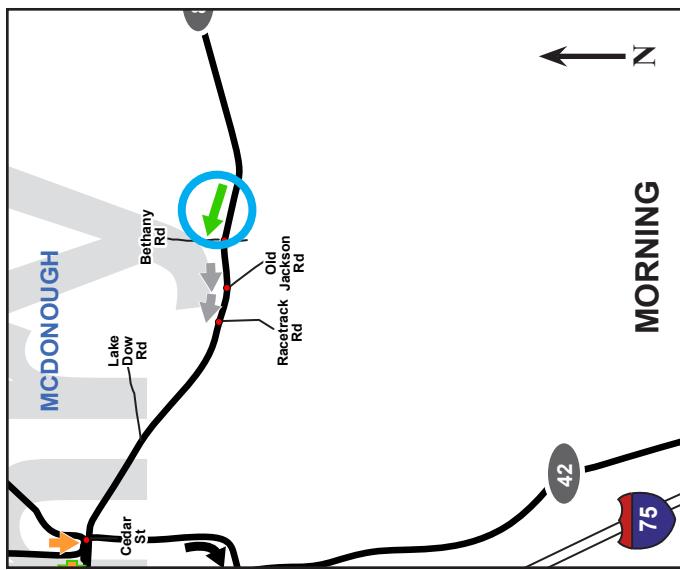
SOUTHBOUND



During the 2004 survey, northbound and southbound congestion was found on SR 155 approaching the intersection at Millers Mill Rd; while surveyed in 2008, the intersection was under construction in conjunction with the replacement of a bridge located 200 yards to the north. Added capacity at the intersection (3 lanes each direction vs. 1 lane each way in 2004) appears to have eliminated congestion here.

Evening Photos: SR 155 southbound approach to Millers Mill Rd.

PROJECT IMPROVEMENT (Project ID: 0008338): SR 81 at Bethany Rd in Henry County, Morning



WESTBOUND

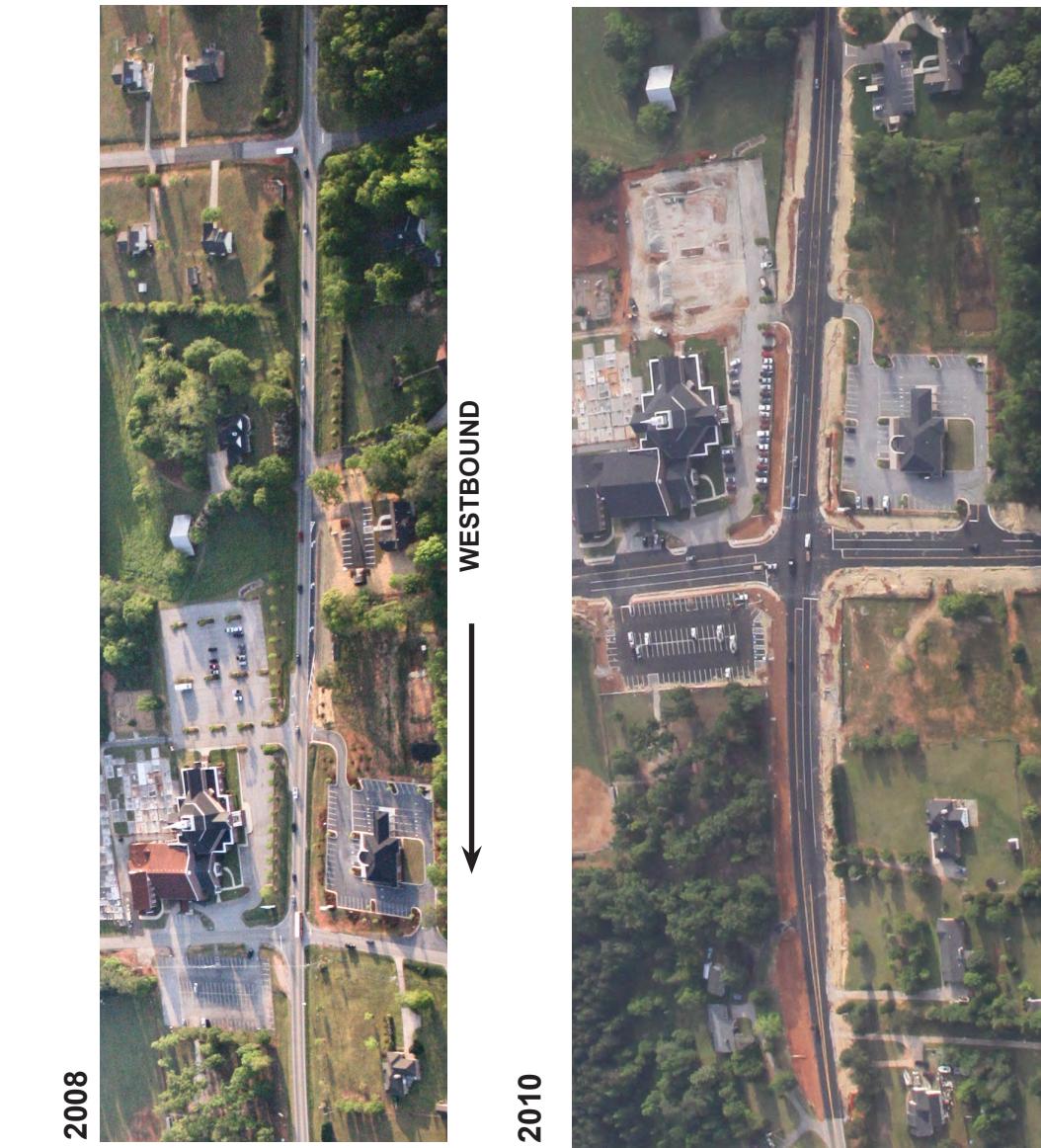
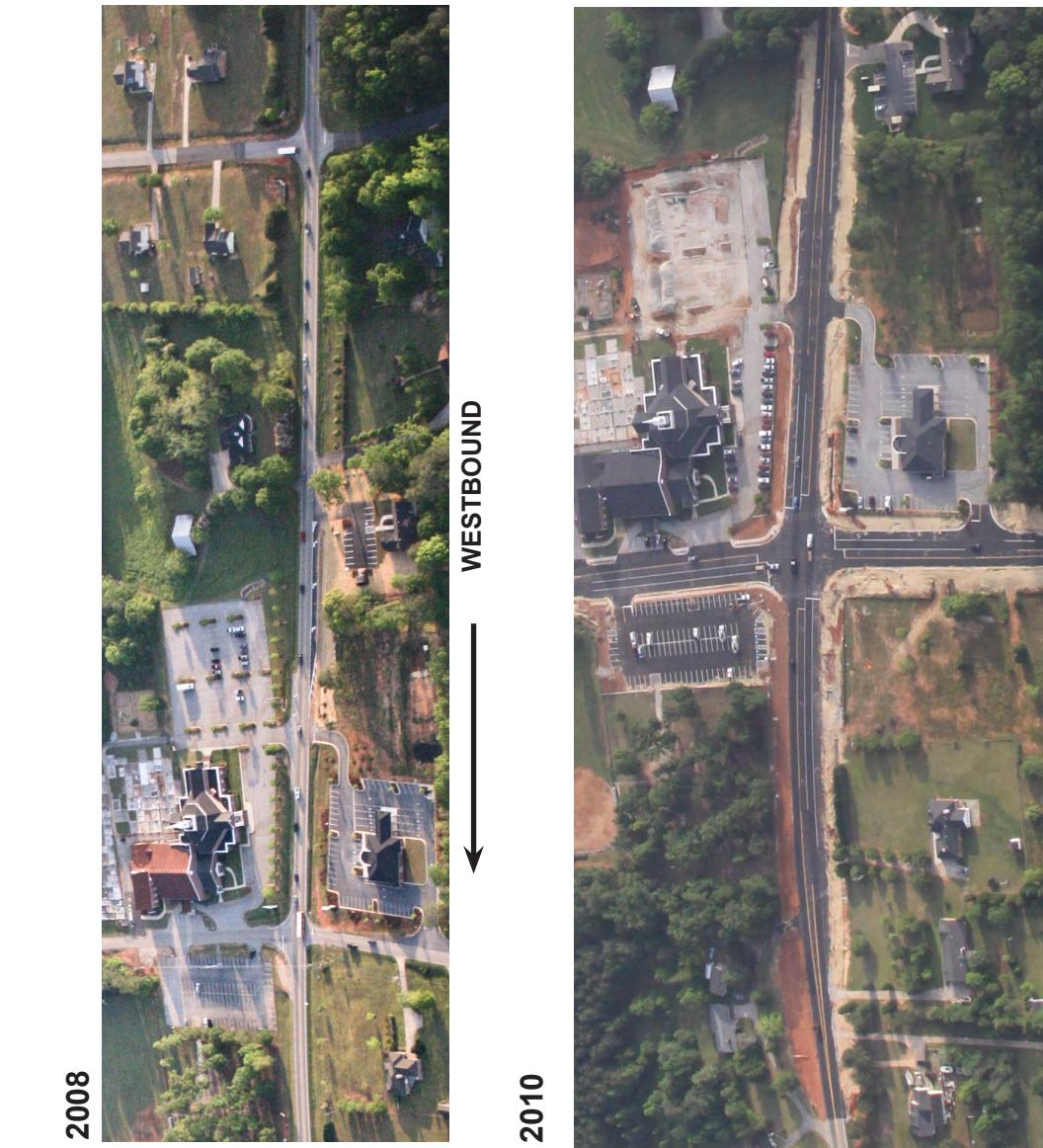
2008



WESTBOUND

Morning Photos: SR 81 westbound approach to Bethany Rd.

These photos show improvements at the SR 81 / Bethany Rd intersection completed between the 2008 and 2010 surveys; increased capacity appears to have eliminated westbound congestion previously found during the morning survey period.



PROJECT IMPROVEMENT (Project ID: 0007854): SR 20 (McDonough Hwy) / SR 212 (Scott Hwy) in Newton County, Morning and Evening

Between the 2008 and 2010 survey, the intersection at SR 20 and SR 212 was widened on all four approaches; the closely spaced intersection at Browns Bridge Rd was also reconstructed. Increased capacity appears to have eliminated congestion that was found here during the morning and evening commuter periods in 2008.



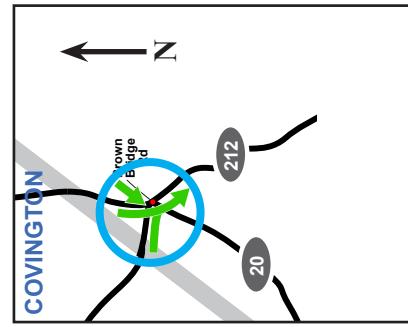
2008

SOUTHBOUND



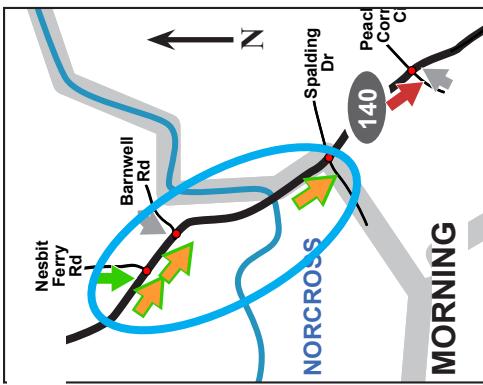
2010

SOUTHBOUND



Evening Photos: SR 20 southbound approach to SR 212.

PROJECT IMPROVEMENT: SR 140 in Fulton and Gwinnett Counties, Morning



Historically, the Chattahoochee River crossing on SR 140 during the morning commuter period generated extensive delays for southbound travelers. The head of the queue was typically found at one of the two signals located south of the river (Spalding Dr and nearby River Exchange Dr); during the peak period, the tail of the queue was typically found one to two miles upstream. Additional delays were also consistently found in Fulton County at the signals at Nesbit Ferry Rd and Barnwell Rd.

During the morning surveys in 2010, intermittent southbound congestion was found at Nesbit Ferry Rd and Barnwell Rd; however, after clearing these signals, southbound travelers flowed at mostly free flow speeds approaching and across the Chattahoochee River. Only minor, intermittent delays were found approaching the signal at Spalding Dr. Photographs from the 2010 survey show new pavement on SR 140 at River Exchange Dr and Spalding Dr; possible retiming of the signals may have contributed to the improved conditions upstream at the river crossing. Also, new congestion downstream at Peachtree Corners Circle suggests the possibility of vehicles being delivered at a higher rate (see SR 140 in degradation section for more details).

2007



2010



Morning Photos: SR 140 southbound approach across the Chattahoochee River.

PROJECT IMPROVEMENT: SR 60 at Old Candler Rd in Hall County, Morning

During the morning peak period in 2008, northbound congestion was typically found on SR 60 approaching the signal at Old Candler Rd. Congestion was not found here during the 2010 morning survey. Configuration of the intersection appeared to be unchanged. It is possible that signal retiming could have accounted for this difference.

2008



2010

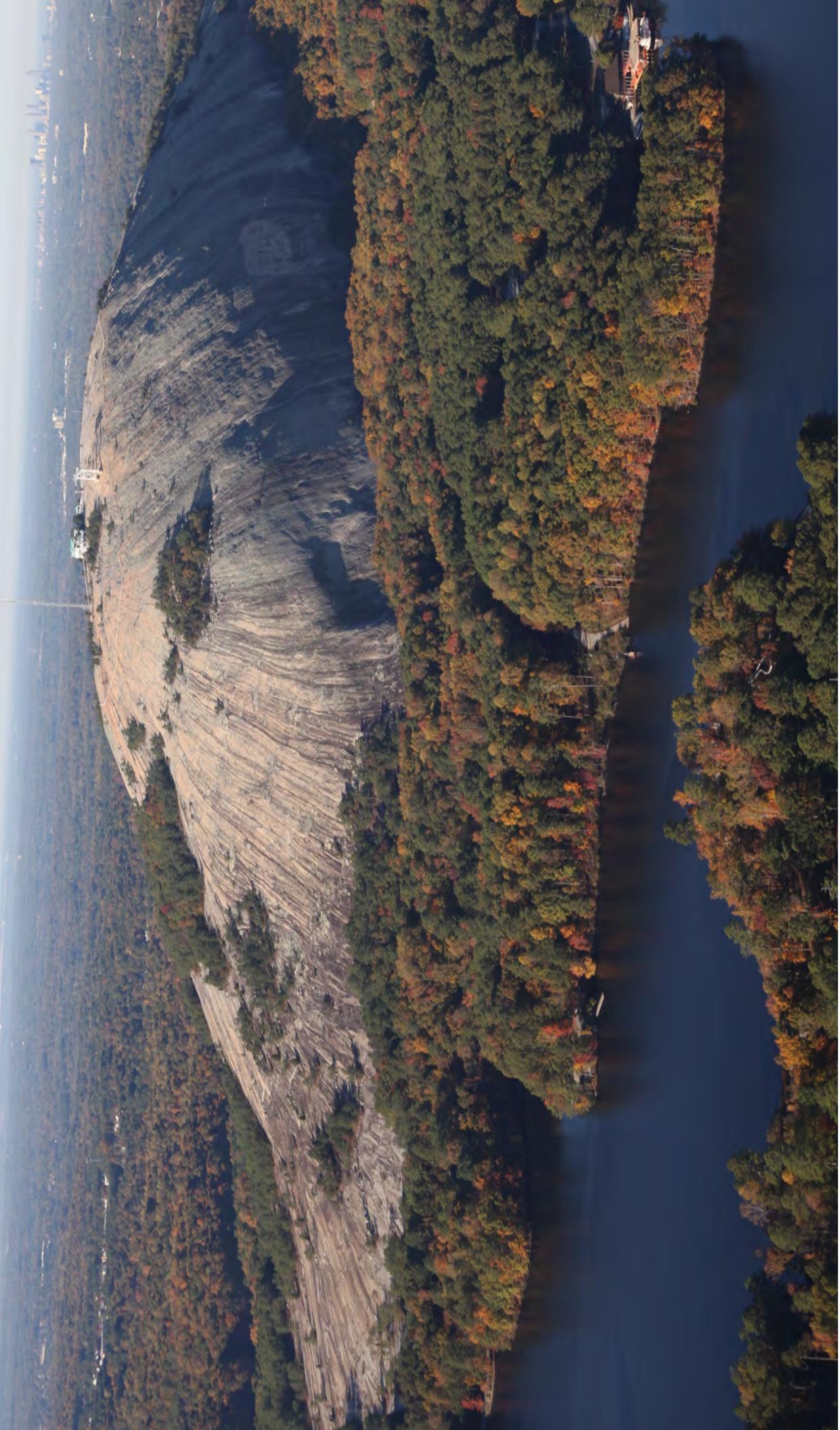


NORTHBOUND



NORTHBOUND

Morning Photos: SR 60 northbound approach to Old Candler Rd.



Section 2.2: Sites with degraded mobility

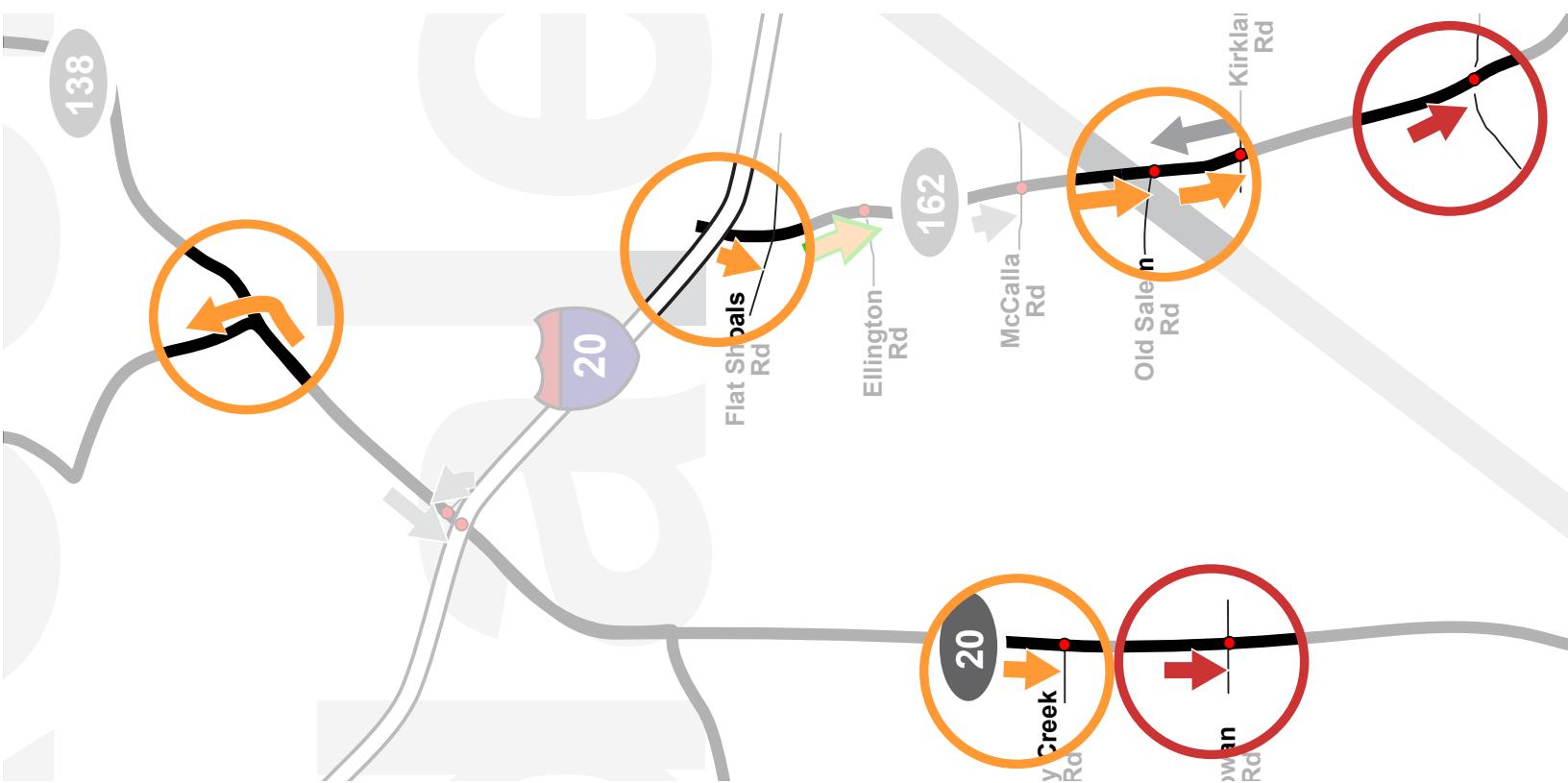
This section highlights many of the areas where significant mobility degradations were found on the system. In screening sites for this section, an attempt was made to identify changes that were largely confirmed during most or all of the 2010 survey flights (minus the effects of confirmed or suspected incidents).

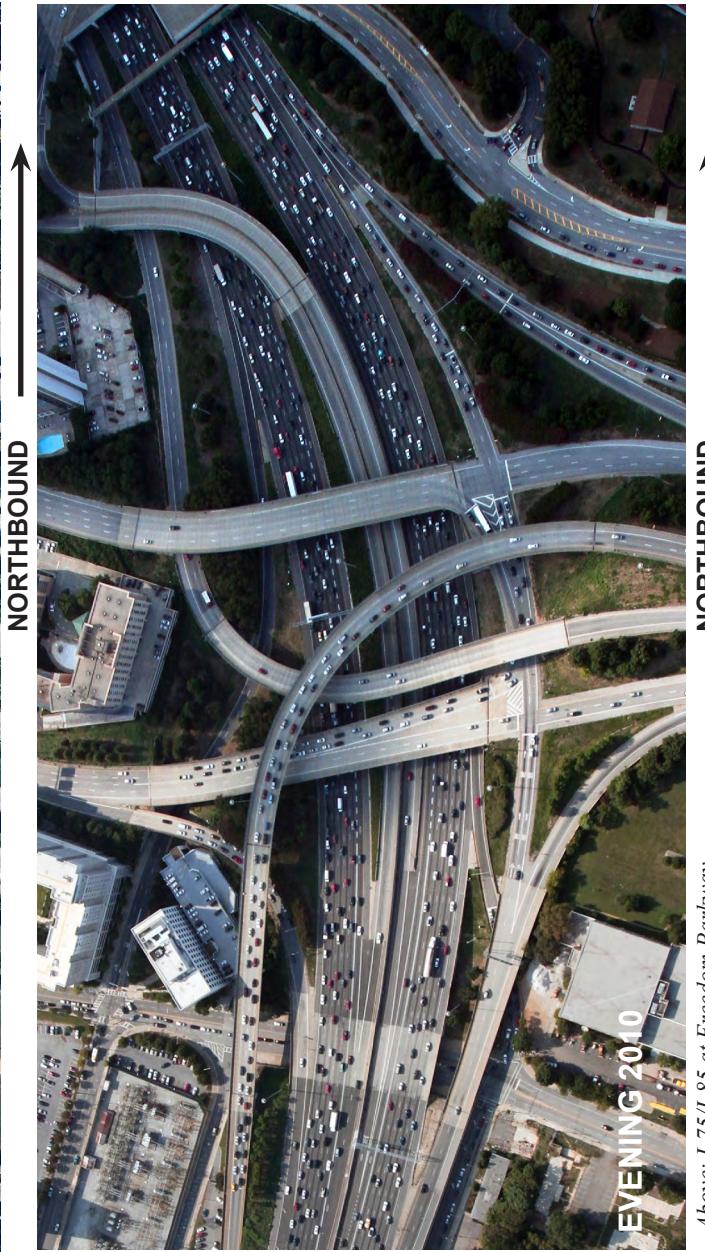
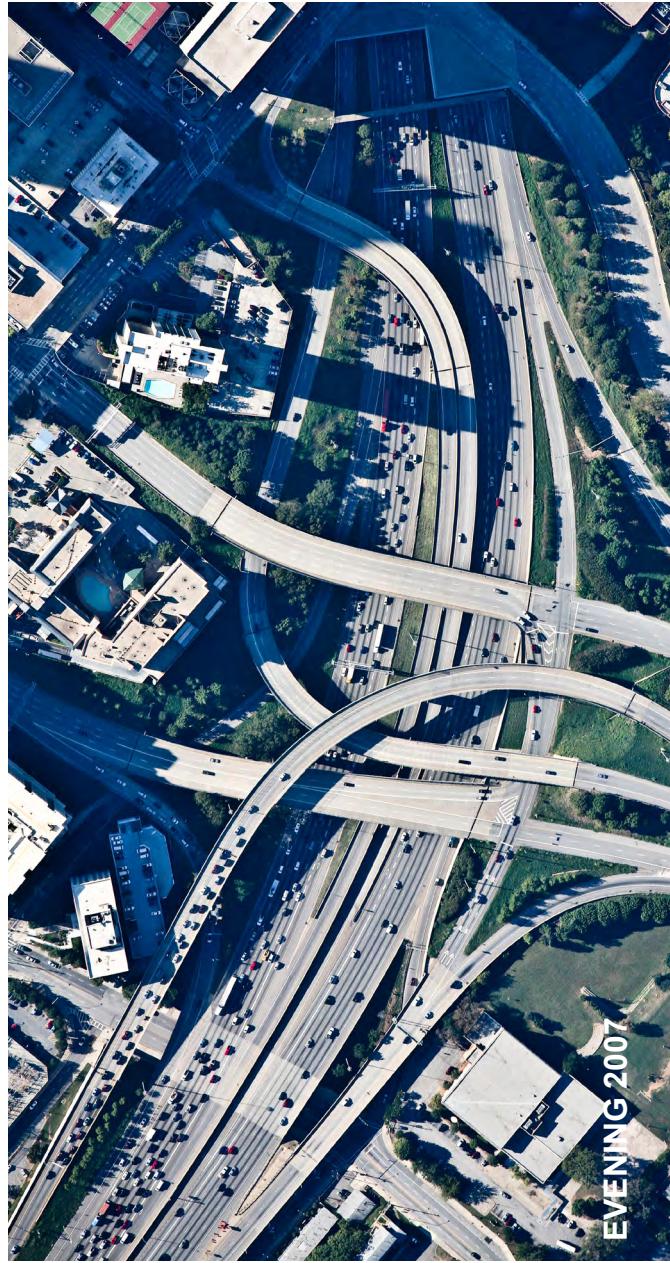
Although logical reasons could not be found for all apparent changes, and although daily variations undoubtedly played a role in some cases, the objective was to report significant findings regardless of whether logical apparent causes could be identified.

INTERPRETING THE MAP FORMAT IN PART TWO

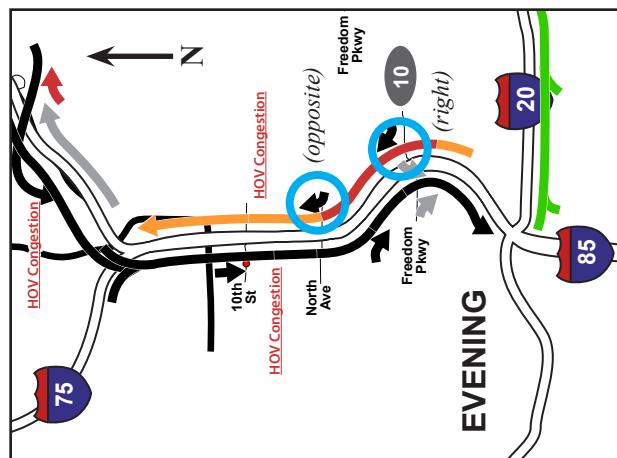
The bottleneck maps presented in Part One have been converted to “Comparative Maps” for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2007/2008 and 2010. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found:

- 1) RED depicts severe congestion that was not necessarily new but significantly degraded;
 - 2) ORANGE depicts minor or intermittent congestion that was not found previously.
- The map insert to the left has examples of all of these types of arrows.



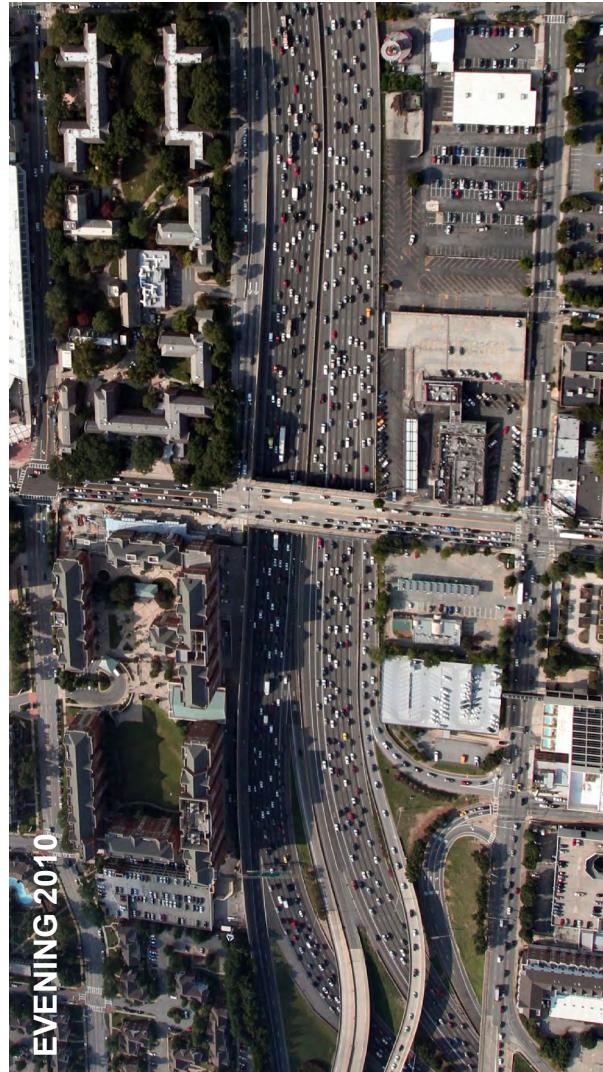


Above: I-75/I-85 at Freedom Parkway





NORTHBOUND



NORTHBOUND

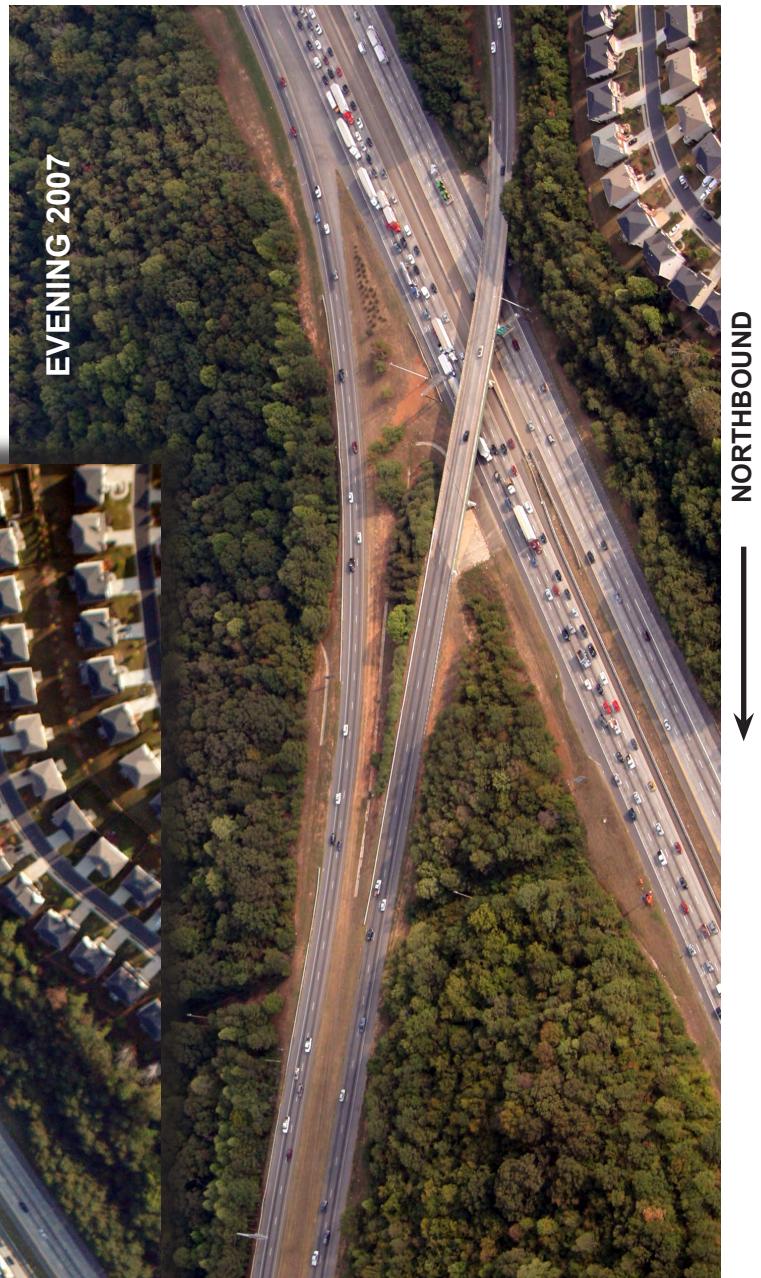
Above: I-75/I-85 at North Ave/Spring St

FREEWAY DEGRADATION: Northbound I-75/I-85 in Fulton County, Evening

In 2005, moderate northbound congestion was typically found after 5:00 p.m. on I-75/I-85 between SR 10 and the I-75/I-85 split; this congested zone ranked as one of the top 20 congested corridors.

The primary bottleneck appeared to be weaving approaching the I-75/I-85 split. When surveyed in 2007, conditions approaching the split improved such that the congested zone no longer ranked among the top 20 congested corridors. An apparent reason for this improvement was not evident.

During the 2010 survey flights, congestion was consistently found after 4:30 p.m. between I-20 and the I-75/I-85 split; the corridor now ranks among the top 10 on the congested corridors list. While weaving approaching the split presumably contributed to the congestion, traffic entering at SR 10, Williams St and Spring St appeared to be primary causes; traffic on these entrance ramps typically extended back onto the arterial network.



NORTHBOUND



NORTHBOUND

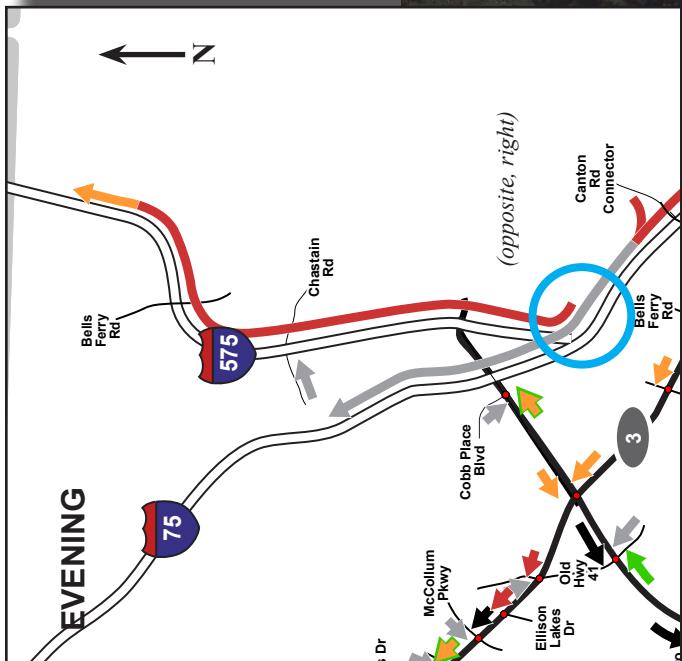


FREEWAY DEGRADATION: Northbound I-575 in Cobb County, Evening

During the 2005 survey, northbound congestion was found on I-575 between I-75 and Towne Lake Parkway. In 2007 this corridor was highlighted as an improved corridor; an auxiliary lane was added between SR 92 and Towne Lake Parkway that helped preclude congestion from forming at the SR 92 merge. Accordingly, only intermittent congestion was found along this corridor in 2007, helping it drop off the “top 20” list. Congestion observed during 2010 was more severe than had been observed during the 2005 survey, the corridor returned to the “top 10” congested corridors list, with average vehicle delays of over 10 minutes. The reason for the apparent degradation in 2010 was not evident.

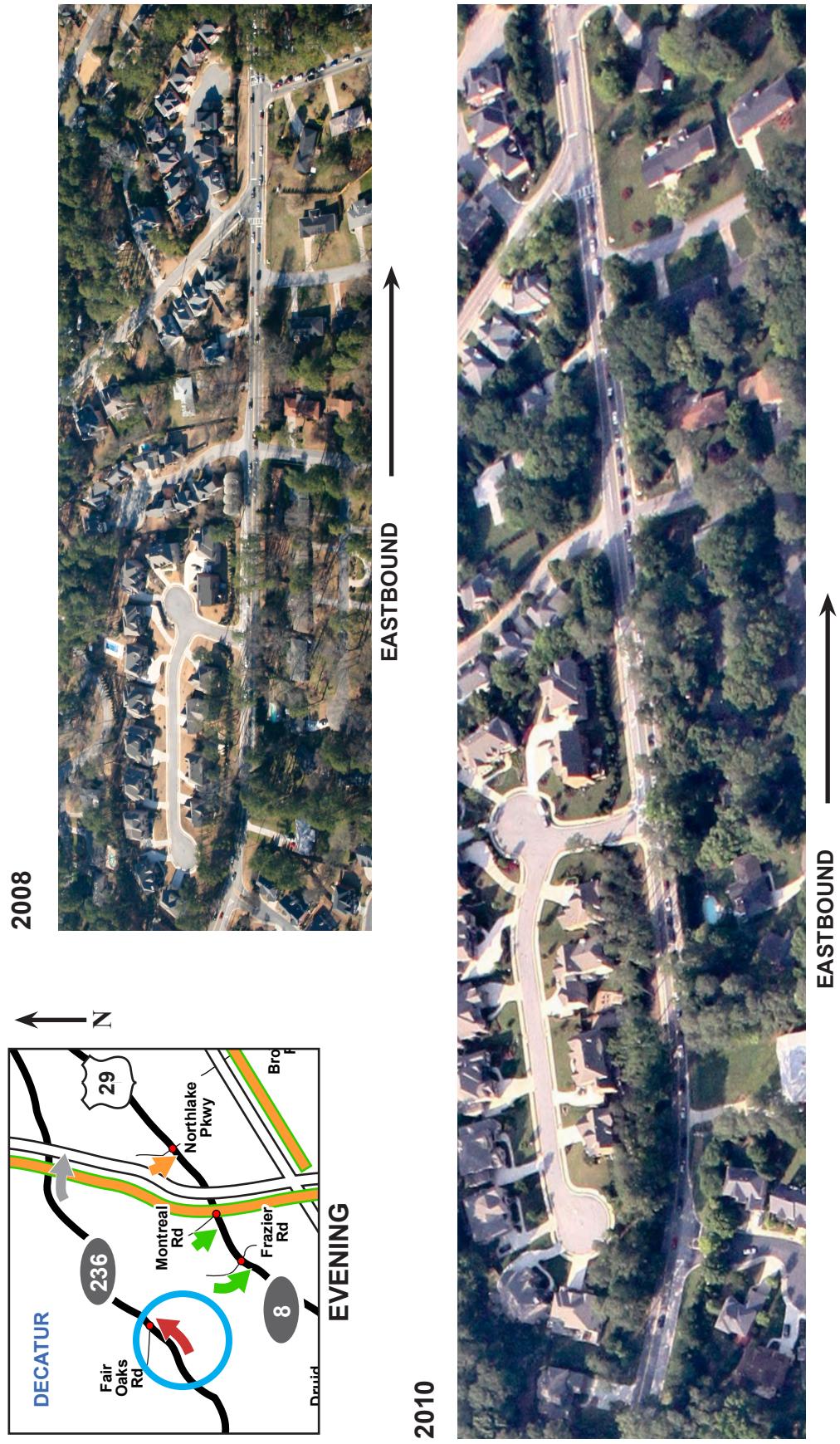


Above, Opposite: I-675 at I-75



ARTERIAL DEGRADATION: Eastbound SR 236 at Fair Oaks Rd in Fulton County, Evening

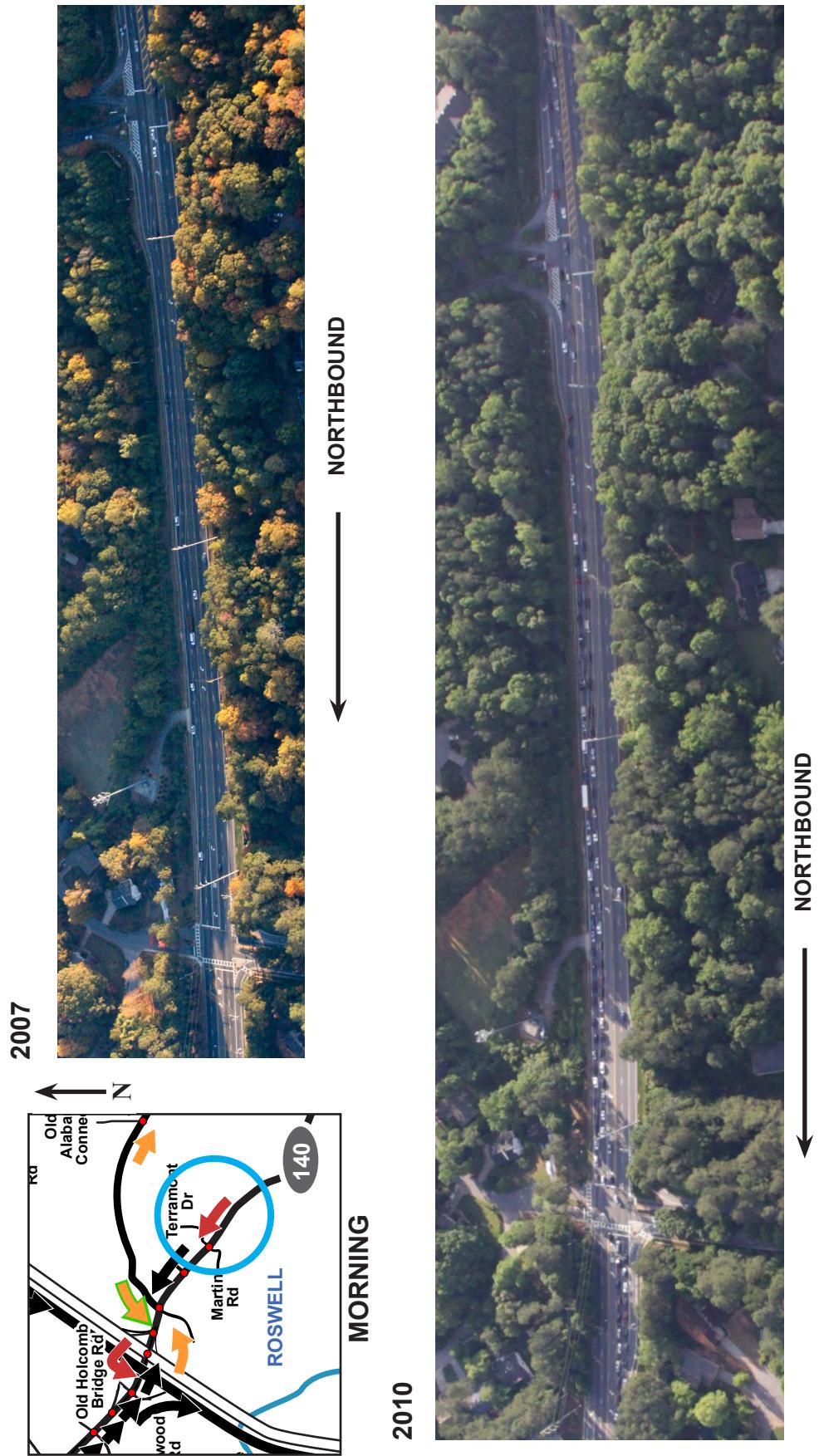
Eastbound congestion on SR 236 at Fair Oaks Dr was not entirely new as similar congestion was found here during the 2004 survey (albeit queuing not as severe); significant delays were not found here during the 2008 survey.



Evening Photos: The 2010 photo depicts eastbound congestion on SR 236 approaching the signal at Fair Oaks Rd.

ARTERIAL DEGRADATION: Northbound SR 140 at Terramont Dr in Fulton County, Evening

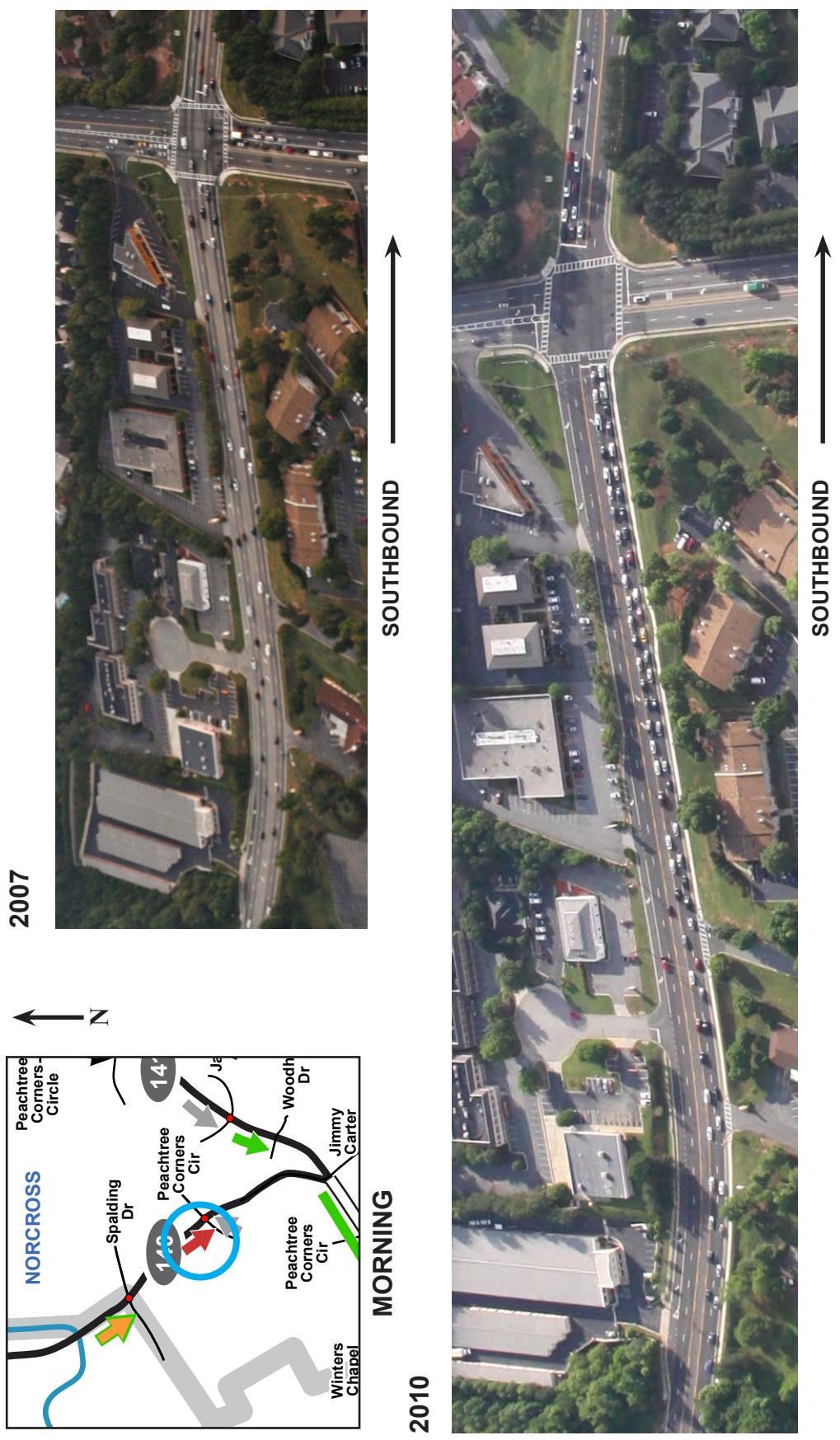
Northbound congestion on SR 140 approaching the SR 400 interchange has been documented during previous surveys, with the primary bottleneck found at Old Alabama Rd. However, during the 2010 survey, additional delays were found on SR 140 upstream approaching the signal at Terramont Dr; at times, throughput at this signal may have been restricted by downstream congestion.



Morning Photos: The 2010 photo depicts northbound congestion on SR 140 approaching the signal at Terramont Dr.

ARTERIAL DEGRADATION: Southbound SR 140 at Peachtree Corners Circle in Gwinnett County, Morning

New congestion was found on SR 140 south of the Chattahoochee River approaching the signal at Peachtree Corners Circle; this congestion may be a result of vehicles arriving at an increased rate due to the mitigation of an upstream bottleneck (see SR 140 in improvement section for more details).



ARTERIAL DEGRADATION: Eastbound SR 20 in Cherokee County, Evening

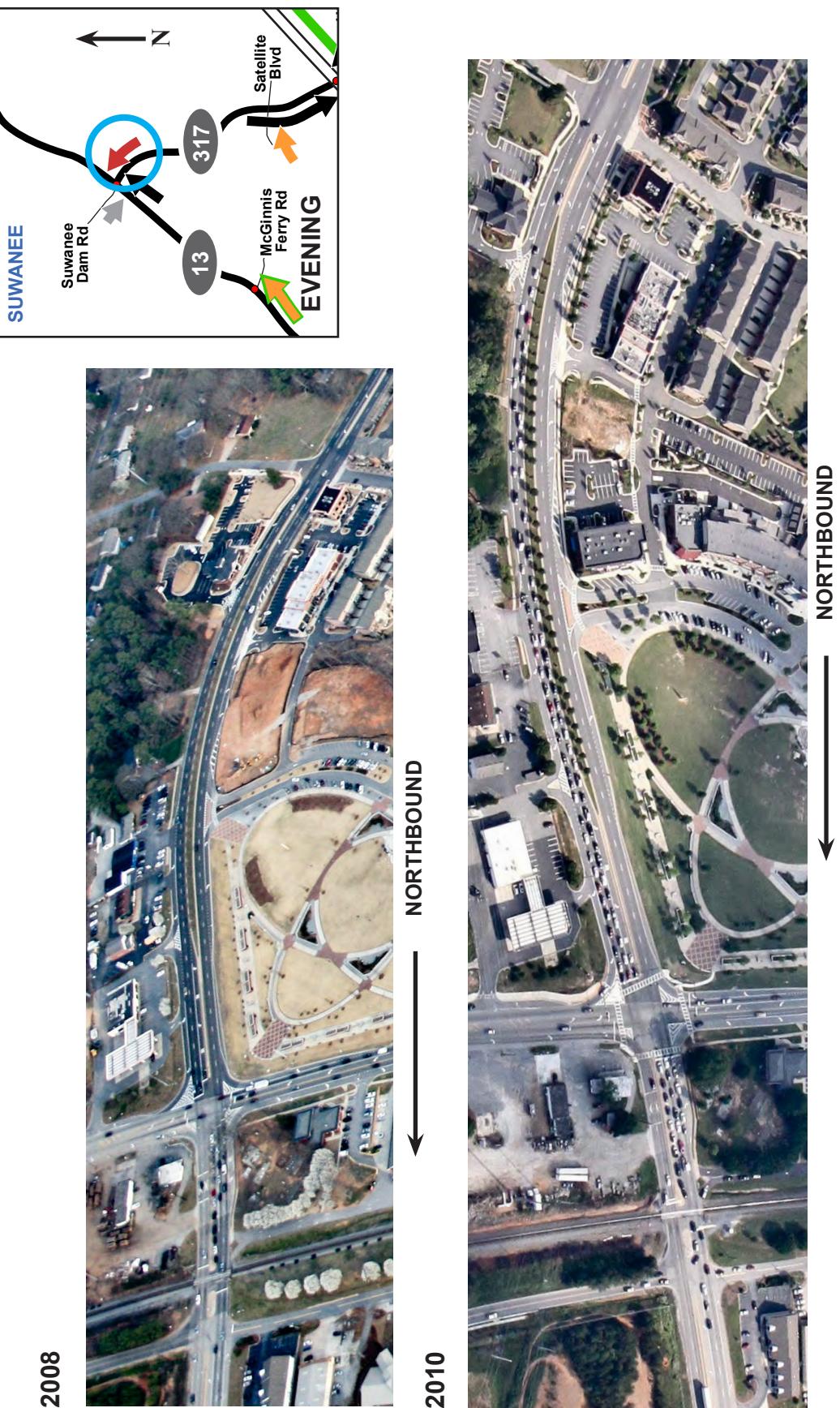
A new signalized intersection (at or near Old Doss Rd) associated with a new development adjacent to SR 20 generated eastbound congestion. During the 2008 survey, only large platoons were found along this section of SR 20 while under construction.



Evening Photos: The 2010 photo depicts eastbound congestion on SR 20 just east of the I-575 Interchange.

ARTERIAL DEGRADATION: Northbound SR 317 at SR 13 in Gwinnett County, Evening

New northbound congestion was found on SR 317 approaching the signalized intersection at SR 13; however, similar congestion was found northbound on SR 13 and eastbound on Suwanee Dam Rd.



Evening Photos: The 2010 photo depicts northbound congestion on SR 317 approaching the signal at SR 13.

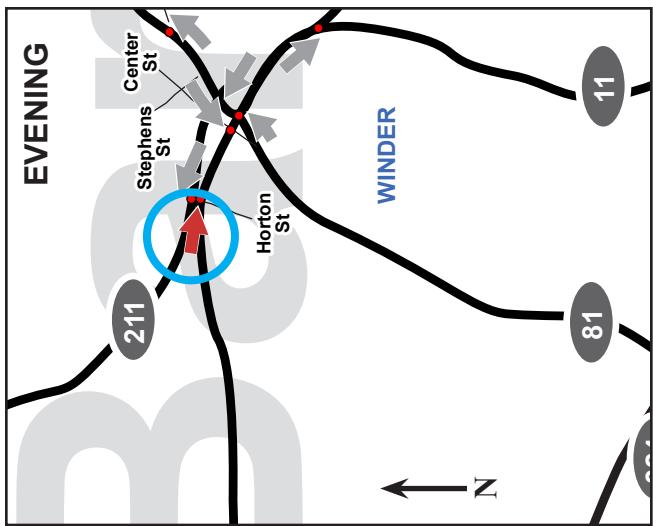
ARTERIAL DEGRADATION: Southbound SR 211 at Horton Rd in Barrow County, Evening

A new evening bottleneck was found on SR 211 at Horton St in Winder. Congestion had been found during previous surveys at Horton St; however, this was on the parallel route SR 8. (While rail traffic was not observed, it is possible that the railroad crossing was a contributing factor.)

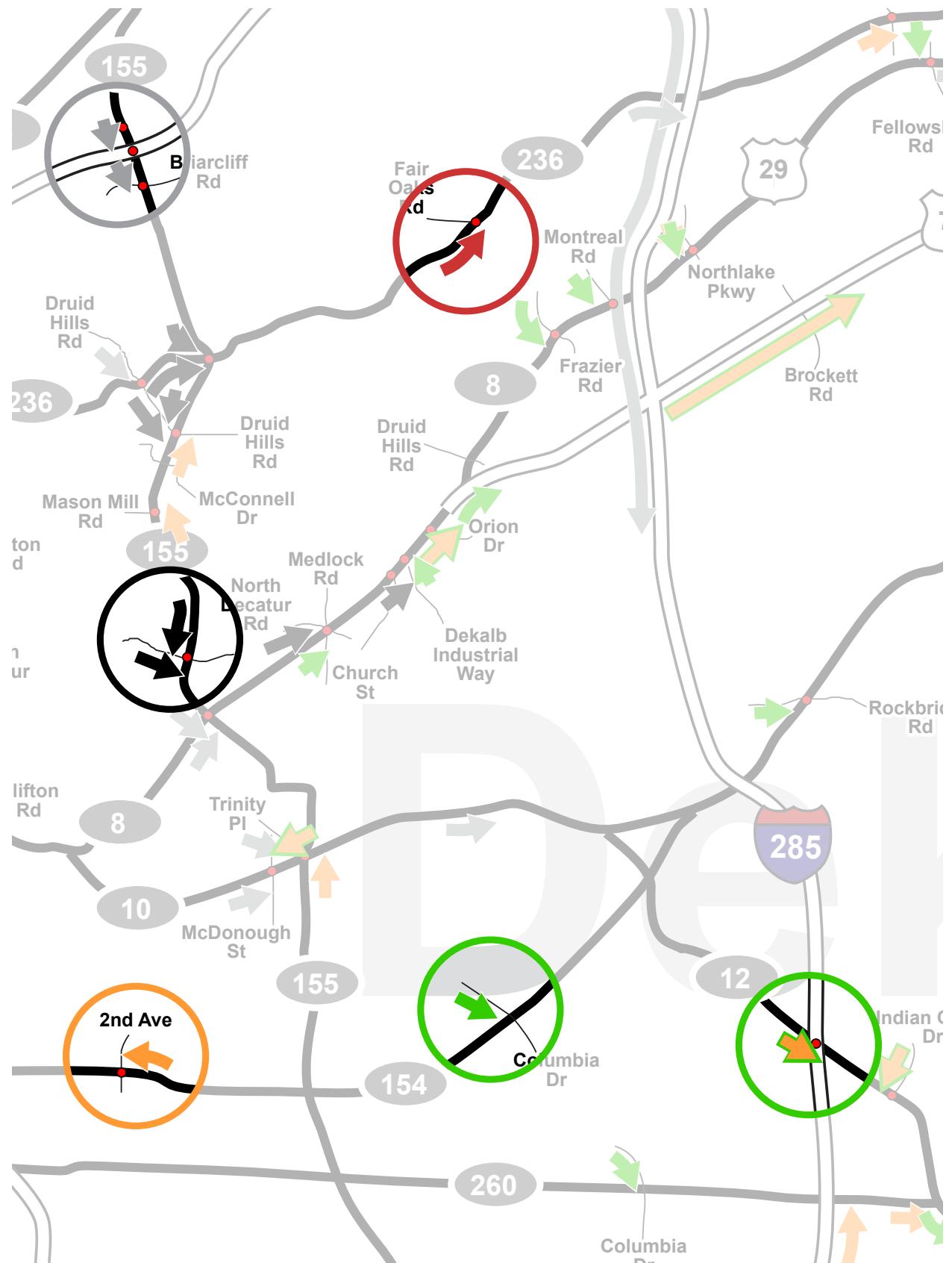
2008



2010



Evening Photos: The 2010 photo depicts southbound congestion on SR 211 approaching the signal at Horton Rd.



Sections 2.3 and 2.4: Comparative Arrowhead Maps (Morning and Evening)

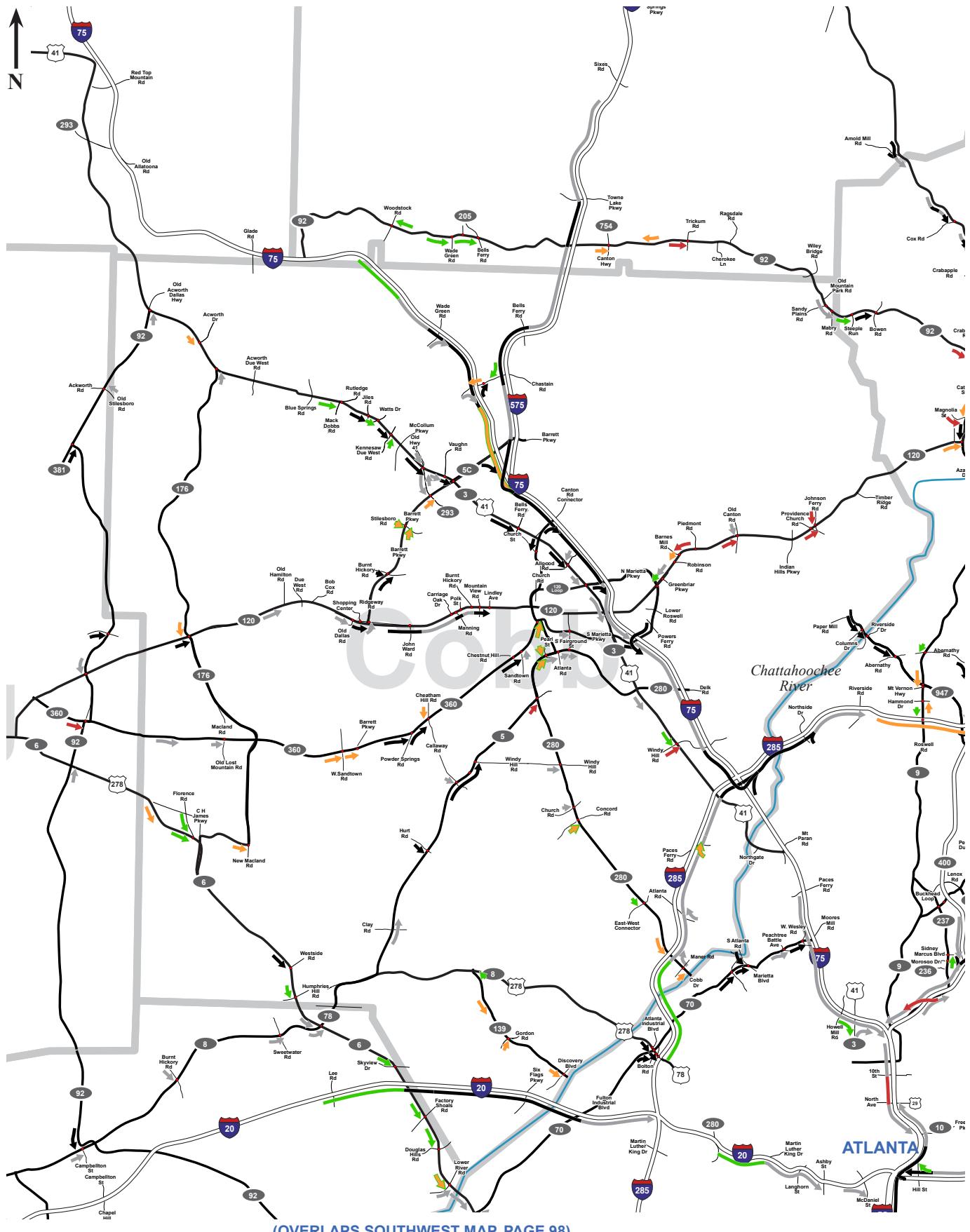
The next two sections present the complete set of morning and evening comparative arrowhead maps, as they appear at the Georgia DOT website (www.dot.ga.gov/statistics/trafficsurvey/). Please note that some of the outlying areas have been cut-off; those areas can be examined at the website.

As previously described, the bottleneck maps presented in Part One have been converted to “Comparative Maps” for Part Two. These maps have been modified to highlight exactly where significant changes have been found on the network, between 2007/08 and 2010. The comparative maps differ from the Part One bottleneck maps in that many red and orange arrows -- those that depict where congestion has NOT significantly changed -- have been switched to less prominent black and gray. Bright colors (red, orange and green) have been used to highlight ONLY where the significant changes were found:

- 1) RED depicts severe congestion that was not necessarily new but significantly degraded;
- 2) ORANGE depicts minor or intermittent congestion that was not found previously.
- 3) GREEN arrows have been added to depict where previous congestion was no longer found.
- 4) Lastly, a special symbol was needed where previously-severe congestion was partially mitigated to less-severe levels; ORANGE arrows with GREEN BORDERS were used in these situations.

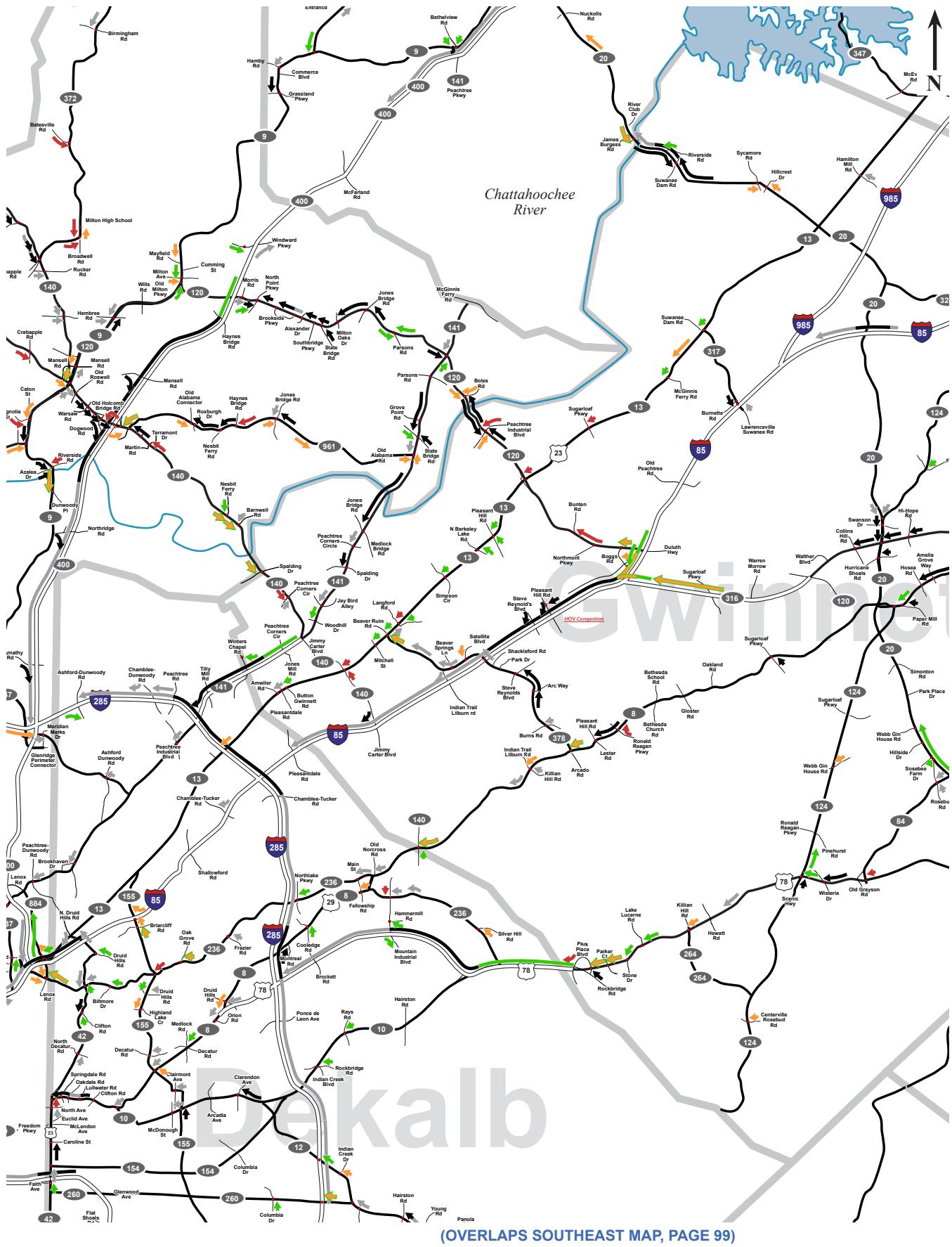
The map cut-out to the left has examples of all of these types of arrows.

NORTHWEST COMPARATIVE MAP (morning)



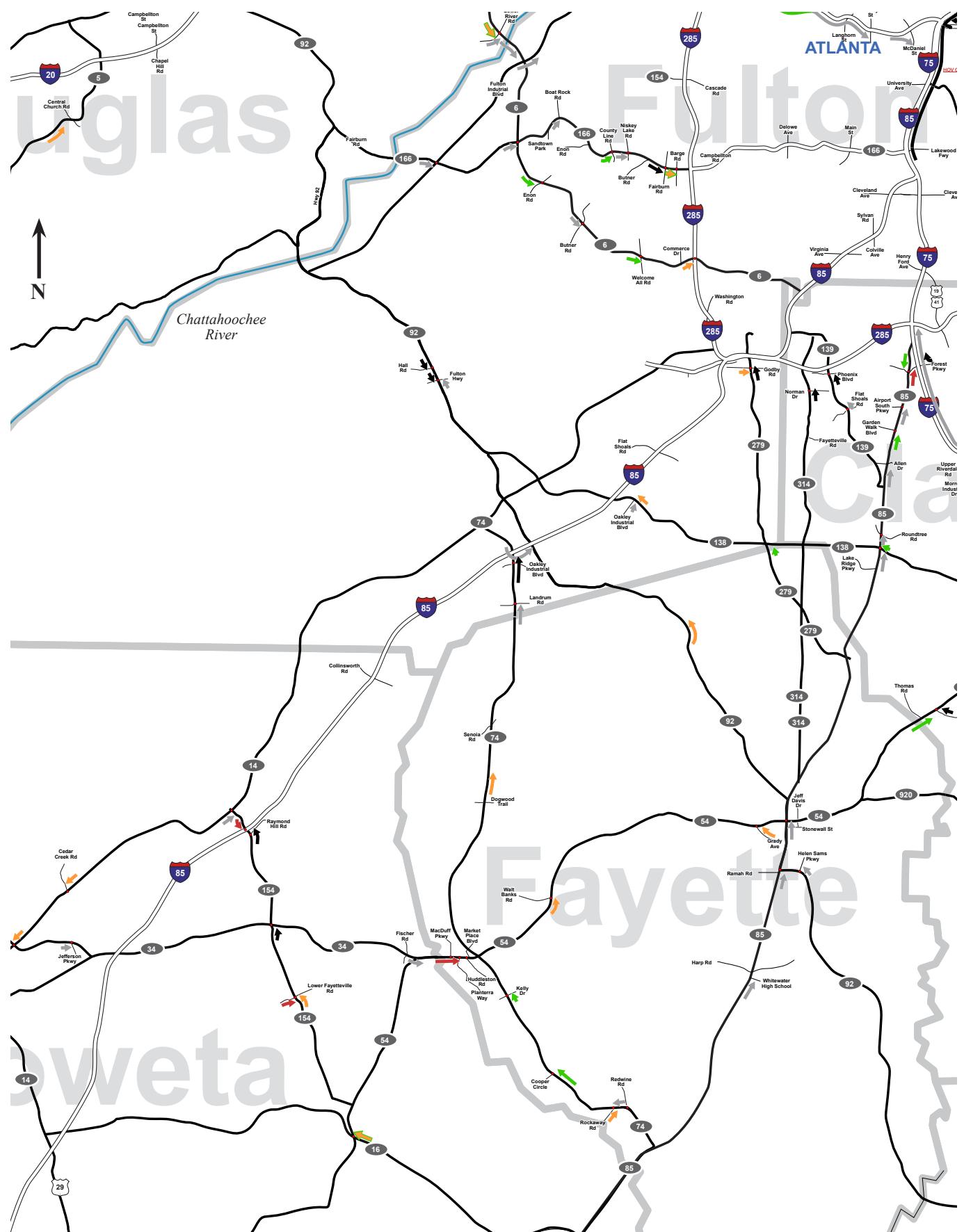
(OVERLAPS SOUTHWEST MAP, PAGE 98)

NORTHEAST COMPARATIVE MAP (morning)

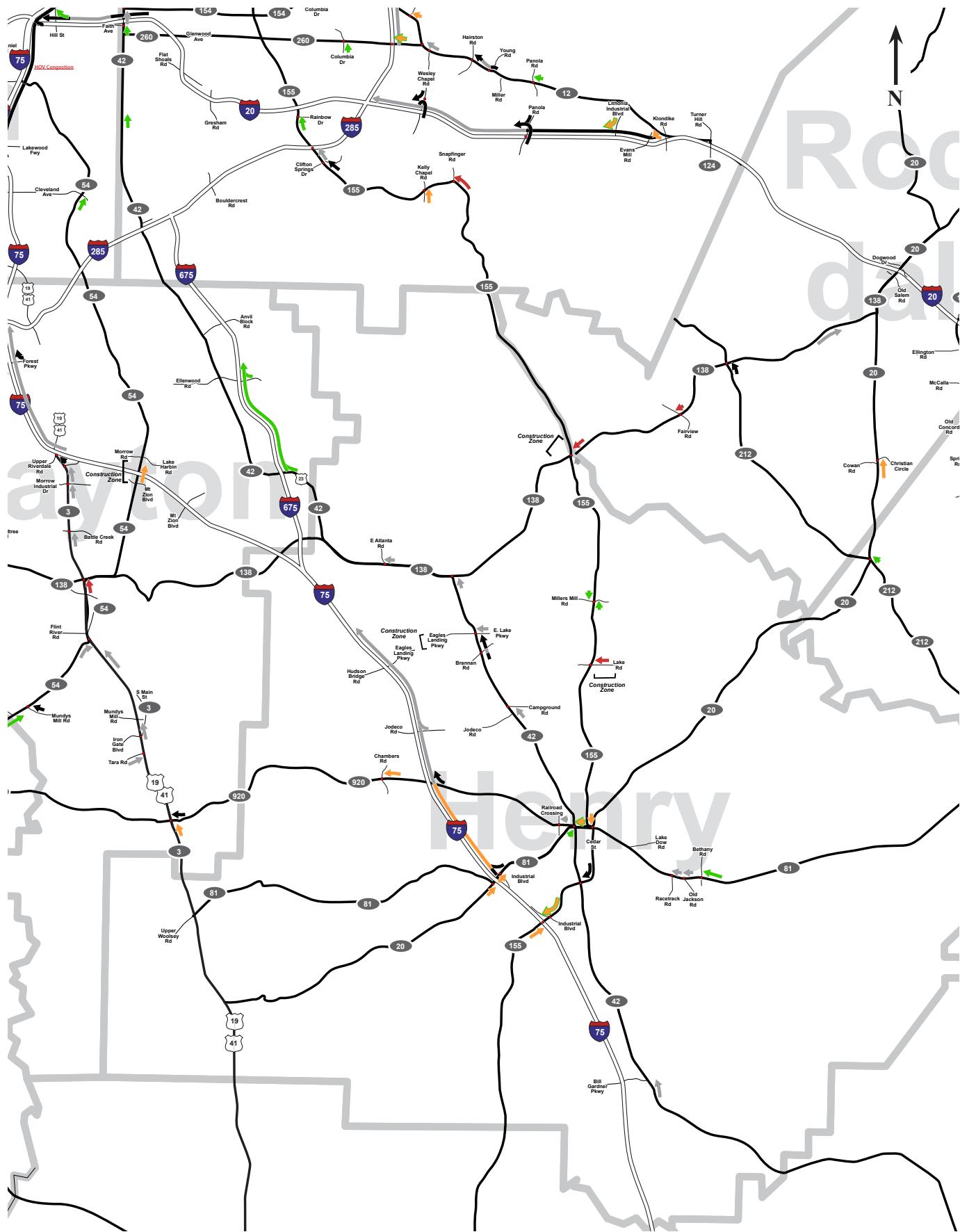


(OVERLAPS SOUTHEAST MAP, PAGE 99)

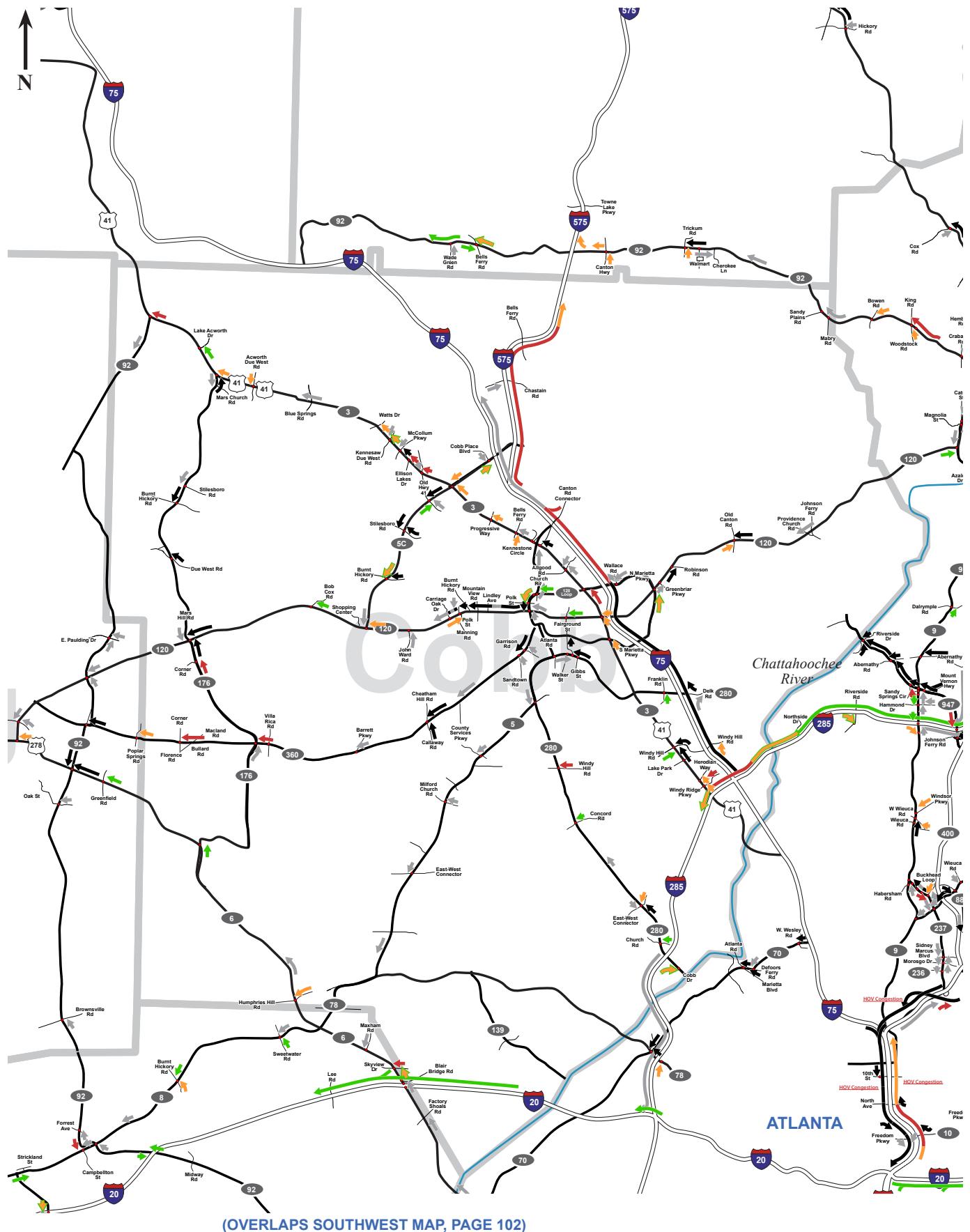
SOUTHWEST COMPARATIVE MAP (morning)



SOUTHEAST COMPARATIVE MAP (morning)



NORTHEAST COMPARATIVE MAP (evening)



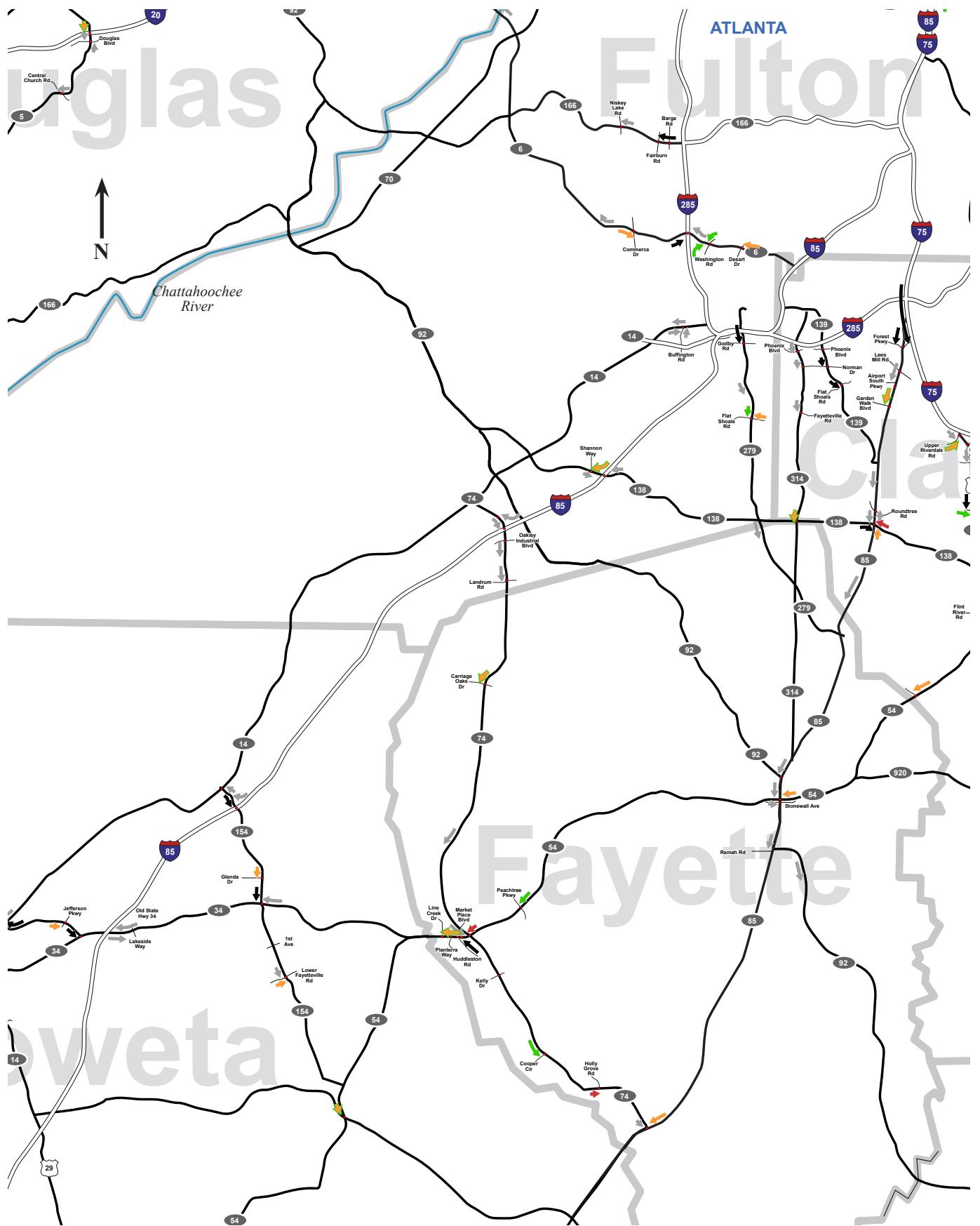
(OVERLAPS SOUTHWEST MAP, PAGE 102)

NORTHEAST COMPARATIVE MAP (evening)



(OVERLAPS SOUTHEAST MAP, PAGE 103)

SOUTHWEST COMPARATIVE MAP (evening)



SOUTHEAST COMPARATIVE MAP (evening)

